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Misguided Economy

A CASE FOR SECOND THOUGHTS

IT is natural for everybody likely to be affected by the Government's proposed economy measures to raise objections: to show that their particular activities are essential and should be expanded rather than restricted.

Having stated this self-evident truth we now proceed to put in a plea for electricity supply. It has been announced by Ministers that such cuts in expenditure upon electrical development as are to be made will not fall upon the power plant side. This is satisfactory as far as it goes, but it means little when so many factors are already operating against the provision of sufficient generating capacity.

Specious Argument

This same inadequacy of power plant has led Ministers to assert that it is obviously wrong to encourage increase in electricity consumption by extending distribution systems. From this they argue that cuts in distribution programmes will not only make a contribution to the savings which have to be made in capital expenditure, they will also greatly improve the power situation or at least prevent it from deteriorating.

This argument is so sound on the face of it that it is hard to refute and yet it must be refuted. In the first place the Government would not for a moment suggest that any extension of supply for industrial purposes should be withheld. It realizes that electricity is the lifeblood of modern industry. For this reason such vague indications as have been given of the nature of the suggested cuts in expenditure have referred to extensions in rural areas.

But, as we have already pointed out, this idea represents a falling-away from the Government's oft-declared intention of ensuring a supply of electricity to the farmers. This was one of the points put forward to show the absolute necessity of nationalizing electricity supply.

The 1947 Act was accordingly accepted by the rural community as a measure designed largely for their benefit. Its passage stimulated the already clamant demand and the Electricity Boards were overwhelmed with applications from the remotest parts of their areas. Most of them have set about the job in earnest and where they could not run out lines in the immediate future have made promises which they will find it hard to fulfil if their endeavour is cramped by "economy" measures.

Farmers' Dismay

It is evident that the proposal to slow down expenditure upon distribution in rural districts has dismayed the farmers and country dwellers. Sir James Turner, president of the National Farmers' Union, said recently that a "tragic outcome" of the Government's economy measures was that they threatened curtailment of capital investment in rural electrification which he described as one of the most essential instruments in the economic development of British farm-

ing. He believed that the measures proposed would seriously curtail production and he hoped that wiser counsels would prevail. While "tragic" is perhaps a strong term to use in this connection, it is certainly true that we cannot afford to ignore anything which may contribute to the expansion of agricultural output any more than we can neglect industrial electrification. Panic measures are likely to have serious effects on the country's future. There are many ways of saving materials, men and money which could be followed rather than the slowing down of electrical development when national electrification and national efficiency are practically synonymous.

UNIFORM TARIFFS

One of the most worrying matters which the B.E.A. and Electricity Boards have to deal with is tariffs. The aim is uniformity of method, not price, although that is the ultimate goal. There has always been a variety of views on the subject but there must be agreement on one point: the perfectly equitable tariff is unattainable. There seems to be a leaning towards the block tariff. The Southern Electricity Board favours this method, although, as Mr. R. R. B. Brown, the deputy-chairman, said recently, the floor area or number of rooms in a house had much to commend them as bases. The Board prefers the assessment of the block tariff to be made on the number of rooms rather than floor space. In any event, rateable value is productive of too many anomalies.

COUNCILS AND BOARDS

It is, of course, desirable that Electricity Consultative Councils shall be in close touch with their corresponding Electricity Boards, but care must be taken that they do not come to be regarded as mere instruments of the Boards. That impression seems to exist in some parts of the country, especially when the Councils have accommodation at the Board's offices and officials of the Boards act as secretaries. It was no doubt with the intention of ensuring close liaison between the bodies that the Council chairmen were made *ex-officio* members of the Boards, but this, too, strengthens the impression to which we have referred. It also seems possible that the chairmen themselves will be uncomfortable if they find that they constitute one-man oppositions on the Boards, as must often be the case.

RURAL DISTRIBUTION

The paper read before the Supply Section of the I.E.E. last week is an extension of the argument for the employment of single-phase distribution in country districts, at least for spur lines to the more remote areas. The system now advocated, as indicated on another page, differs from established British practice, and its legitimatization, including multiple earthing, would need an extension of the Electricity Regulations. The method is, however, not untried, for it is used on a large scale in the United States—but it must be remembered that conditions there are very different from those at home, where there is an urgent need to find some means of reducing the cost of delivering electricity to agricultural territory. While both single- and three-phase distribution will probably continue to be employed, a system for which the authors claimed some 20 per cent saving compared with normal practice cannot be ignored.

SUPER-CONDUCTIVITY

The first aspect to be studied when the U.S. National Bureau of Standards commenced its programme of basic research into superconductivity, which means the virtual disappearance of resistance when current flows through a metal conductor at very low temperature, was the restoration of resistance when the current is large. This phenomenon was reported soon after the discovery of the superconductive state itself, and results from the magnetic field associated with the current. The U.S. Bureau's critical investigation of the transition state has shown that it is dependent upon the diameter of the conductor, whereas the classical theory predicts a behaviour which is independent. These experiments, in which straight cylindrical wires were used, indicate that theoretical expectations may be approached when the wires are very thick.

Railway Power Supply

New Equipment for Liverpool-Southport Electric Lines

WITH the completion of the new control room at Hall Road, Liverpool, the £500,000 modernization scheme of the Liverpool to Southport electric railway has now come into full operation. This scheme was initiated by the former L.M.S. Railway and work commenced in 1945.

Power was originally generated at 7·5 kV 25 c/s three-phase at the Railway's Formby power station and distributed to substations where it was converted to 630 V d.c. by rotary convertors. The plant was improved from time to time during the subsequent years, but at the end of the war it was decided to dispense with the power station and purchase electricity in bulk. The necessary arrangements were made for a duplicate supply from the Liverpool undertaking and electricity is now supplied at Bank Hall by the Merseyside and North Wales Electricity Board at 33 kV through two separate feeders originating from different sections of the busbars at Clarence Dock power station, one of them passing through the Board's Beaumaris Street substation.

The two feeders are interconnected and each is brought into a separate switchhouse at Bank Hall. These are symmetrically placed at opposite ends of the main supply point and each contains 33 kV 500 MVA oil circuit breakers, one acting as an incoming feeder switch, one controlling the supply to a 33/11 kV 15 MVA transformer and a third controlling the interconnector. The main 15 MVA transformers are also situated symmetrically one at each end of the site and deliver 11 kV to two substations from which the Railway's 11 kV distribution system originates. The choice of this voltage for distribution was dictated by economic considerations as it was possible to use a considerable section of the original

Interior of the control room situated at Hall Road about half way between Liverpool and Southport

7·5 kV overhead transmission line.

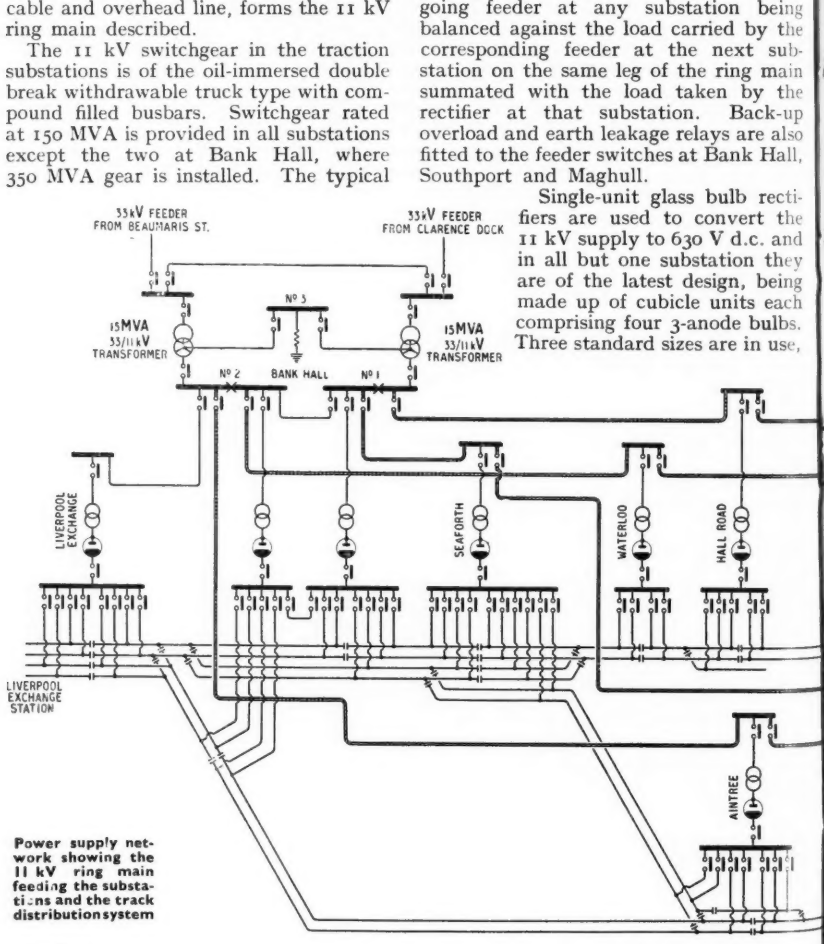
The fourteen traction substations are now fed by two ring mains, one supplying the substations between Liverpool and Southport and the other those between Liverpool and Ormskirk, short spurs from the ring mains feeding the ones at Liverpool Exchange and Aughton Park. They are connected alternately to each leg of the ring main so that in the event of a fault it is unlikely that adjacent substations will be affected. In all, 35 miles of new cable has been installed, which, together with the 16 miles of existing cable and overhead line, forms the 11 kV ring main described.

The 11 kV switchgear in the traction substations is of the oil-immersed double break withdrawable truck type with compound filled busbars. Switchgear rated at 150 MVA is provided in all substations except the two at Bank Hall, where 350 MVA gear is installed. The typical substation houses two 11 kV breakers, one controlling rectifier equipment and the other the outgoing feeder.

The incoming feeder is solidly connected to the switchgear busbars, but this arrangement is modified at the substations remote from Bank Hall. At Maghull, for instance, a sectionalizing breaker has been installed so that in the event of a fault at least one of the adjacent substations can still function.

Protection of the 11 kV system is by relays operating on the balanced voltage principle, the load carried by the outgoing feeder at any substation being balanced against the load carried by the corresponding feeder at the next substation on the same leg of the ring main summated with the load taken by the rectifier at that substation. Back-up overload and earth leakage relays are also fitted to the feeder switches at Bank Hall, Southport and Maghull.

Single-unit glass bulb rectifiers are used to convert the 11 kV supply to 630 V d.c. and in all but one substation they are of the latest design, being made up of cubicle units each comprising four 3-anode bulbs. Three standard sizes are in use,



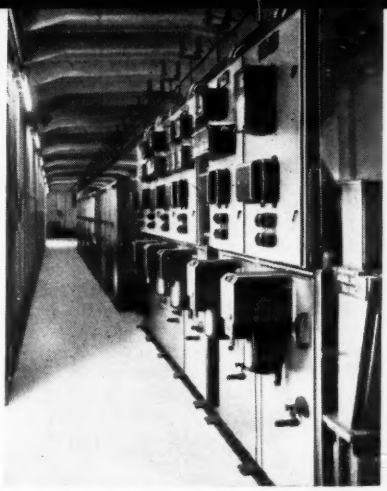
Power supply network showing the 11 kV ring main feeding the substations and the track distribution system

1,260 kW (3 cubicle), 1,680 kW (4 cubicle) and 2,520 kW (6 cubicle), depending on load conditions. These ratings are continuous and the largest equipment can handle overloads of up to 18,000 A for one second. The remaining equipment is made up from rectifiers installed in 1932, which have been modified to suit the new supply voltage and frequency. It comprises sixteen 6-anode bulbs arranged to give an output of 2,000 kW at 360 V d.c.

The rectifier transformers, which are situated outdoors, are wound for 12-phase operation, auxiliary windings providing 110 V for fan and excitation circuits. The connection from the rectifier cathodes is taken through a high-speed circuit-breaker to the substation positive busbar. This breaker is rated at 4,000 A and is fitted with a reverse current trip. A load beyond capacity of the equipment operates a relay on the e.h.v. side which is arranged to open the d.c. breaker.

The sectionalized track is fed through high-speed breakers rated at 2,500 A or 1,500 A. These are arranged to operate on overload and are designed to reclose the breaker a pre-determined number of times after such an operation, finally locking out if the overload persists.

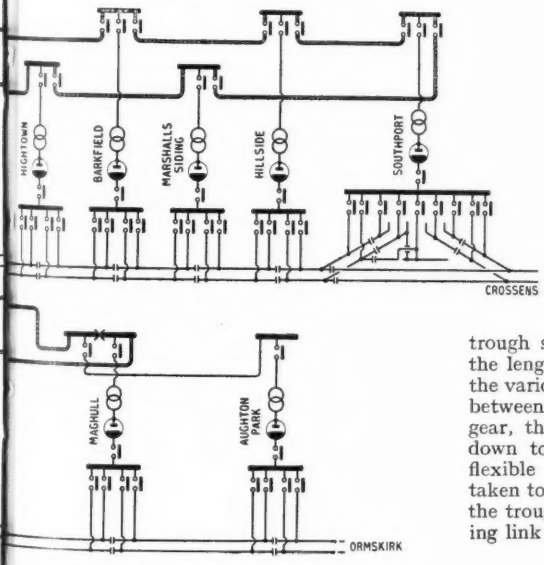
A 415 V three-phase auxiliary supply is available in each substation which in most cases is obtained from an outdoor combined 11 kV switch fuse and transformer unit connected to the outgoing cable. The supply can thus be maintained even though the 11 kV bars are "dead" for maintenance or other reasons.



Bank Hall (No. 1) substation; 11 kV switchgear in foreground and rectifier cubicles beyond

Ten new prefabricated reinforced concrete substations have been erected to accommodate the rectifying equipment. They are about 11ft 6in wide by 10ft high and vary in length from 80ft to 120ft, depending upon the amount of plant installed The interiors have been sprayed with asbestos and holes have been provided in the panels along one side of the buildings to avoid the necessity for cable ducting or trenching in the floor.

A small covered steel trough suspended from the roof runs the length of the building and carries the various control and operating wires between the different items of switchgear, the appropriate wires being led down to individual switches through flexible conduits. All the wires are taken to one end of the building where the trough terminates in a disconnecting link box for testing the circuits.



At one end of each building is a small room housing the 100 V switch-operating battery and the 50 V battery which is used in conjunction with the control equipment. These batteries are trickle-charged from the auxiliary supply.

Fluorescent lighting is installed and, apart from thermostatically controlled electric heaters, two ventilating fans, one at each end of the building, are arranged to come into action if the air temperature becomes excessively high.

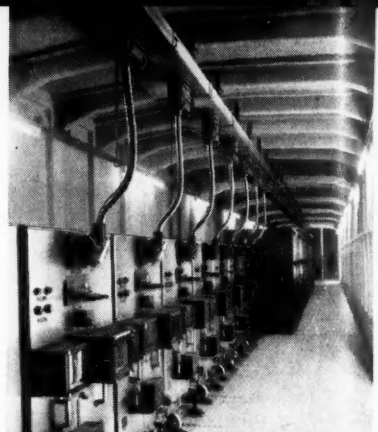
Substations are unmanned and are remotely controlled from the new control room building at Hall Road which lies about half way between Liverpool and Southport. It is of single-storey brick construction, the central portion forming the control room itself. Around this are grouped smaller rooms housing control apparatus, batteries, heating and ventilating plant as well as offices for supervisory staff and accommodation for the control room operators. In the control room itself there is a mimic diagram depicting e.h.v. and track feed systems, on which the conditions of the breakers are indicated by multi-coloured lights, control being effected by means of switches on a setting-up panel.

The substations are controlled over four pairs of pilot lines, two of which cover substations to the south and the other two those to the north. Adjacent substations are connected to alternate pilot pairs so that if there is a fault on one pair, control is not lost over a block of adjoining stations. Duplicate pairs are also run to each substation and the operator can change over from one to the other at will.

As an additional safeguard the equipment in the control room building is housed in two separate rooms, each containing apparatus associated with one north-bound and one south-bound pilot system. If, therefore, one room went completely out of action it would still be possible to control alternate substations.

In addition, two subsidiary systems are brought to the desk, one giving control over and indication of certain 33 kV circuit breakers at Bank Hall, and the other providing information concerning the more important auxiliary equipment at Southport.

The use of glass bricks in the construction of the building provides ample natural light for working during the day and at night indirect fluorescent lighting is used. Fully automatic heating and air conditioning is provided throughout the building, the whole apparatus being controlled thermostatically and by means of a compensator unit catering for changes in external weather conditions. In view of the important functions exercised by the control room, duplicate auxiliary supplies are provided together with duplicate 50 V batteries for operating the remote control equipment. All wiring in the building, apart from the multi-core cables between the control apparatus and the desk, has been carried out in copper-sheathed mineral-insulated cable.



Interior of one of the remotely controlled substations viewed from the d.c. switchgear end

Electrodepositors' Society

AT the 23rd annual general business meeting in London of the Electrodepositor's Technical Society it was reported that 226 applications for membership were received during the year; there were 30 resignations and 80 lapsed; the net increase of 113 raised the total to nearly 1,000. The Standards Committee has been reconstituted as a sub-committee of the Council. The London Section has been re-organized on the lines of the Midlands Centre (Birmingham) and the Sheffield and North-East Centre under a committee of six with Mr. R. A. F. Hammond as chairman and Mr. H. A. Holden as secretary. Five committees have been set up with a view to decentralizing some of the work of the honorary officers of the Society.

NEW BOOKS

Overhead Line Practice. By John McCombe. Pp. 269; figs. 158; index. MacDonald & Co. (Publishers), Ltd., 19, Ludgate Hill, London, E.C.4. Price 25s.

A great deal of practical information on overhead line construction and maintenance is to be found only in publications, reports and instructions issued on specific aspects of the subject by manufacturers and users. Dr. McCombe has therefore performed a useful task by making such information available in a convenient form. In addition, he is able to give much sound advice based on his extensive practical experience with overhead lines. The aim of the work, as stated in the preface, is to present it in simple everyday language in the hope that it will be read by foremen and linesmen as well as by engineers and others associated with the transmission and distribution of electricity by overhead lines.

The book opens with an account of the surveying and plotting of profiles of overhead line routes followed by chapters on transport, foundations, wood poles and other supports, cross-arms and stays, insulators, conductors, sags and tensions, clamps and joints, conductor erection, l.v. distribution, inductive interference and pole-mounted substations. Finally, there is a timely plea for the establishment of training schools for linesmen.

A few critical comments might be made. Table 20 may be misleading as it implies that porcelain and glass insulators might have different electrical characteristics. It is difficult to see why the impulse sparkover of the porcelain insulators is not given and the meaning of the term "*Max.* Impulse S.O.V." is obscure. In the chapter on conductors, it is stated that "Once the conductor gets the initial coating of hydroxide due to exposure this acts as a protector and there is little further corrosion." It is a pity to perpetuate this comforting myth. In the discussion on inductive interference, more stress should be laid on screening effects. For example, a high-conductivity earth wire will reduce the induced voltage to about two-thirds, and railway tracks may reduce it to one-third of its value in the absence of these conductors. Further, the possibility of making the communication circuits less susceptible to induction should always be considered.—J. S. F.

Historic Researches. By T. W. Chalmers. Pp. 288; figs. 85; index. Morgan Brothers (Publishers), Ltd., 28, Essex Street, London, W.C.2. Price 21s, postage 9d extra.

Most engineers have probably read with some dissatisfaction one or more of the many works on modern science by writers of the journalist type; popular and superficial rather than accurate and critical. This book is different, it being an authoritative and lucidly written account of the work of investigators in the various fields of science that are of interest to engineers. It comprises twelve chapters with appendices of mathematical and biographical notes and deals with researches on friction, heat and its mechanical equivalent, ether drift, chemistry, electro-dynamics and the conduction of electricity through liquids and gases, X-rays and molecular physics.

The account of work on the conduction of electricity might have been more effective if it had been rounded off by a chapter on the researches of Ohm in the establishment of his law and of subsequent investigations into the field of its validity. The author's very clear accounts of the researches of the pioneer experimenters are supplemented by some penetrating and scholarly comments on the significance of the results that have been established. His remarks on ether drift experiments, for instance, are in marked contrast to the kind of superficial journalism that expatiates on the downfall of Euclid and Newton.

This work is thoroughly recommended to those engineers who are interested in the nature of the laws underlying the technique of modern applied science. Its educational value is considerable and it is a pleasure to read.—G. W. S.

Views on the News

By REFLECTOR

THOSE who, like myself, pass Battersea power station every morning and evening will rejoice that work is in progress on the last quarter of the buildings. When the station had two chimneys it became the symbol of electric power in thousands of articles and advertisements. The addition of the third chimney made it lopsided and so it has remained for a very long time. The fourth will restore its symmetry and complete the first of the really modern power stations. But it is doubtful whether it will regain its former eminence; several of the later stations rival or surpass it in architectural value. It is hoped, however, that its reputation for efficiency will be maintained.

★ ★ ★

I have occasionally mentioned complaints by anglers of the deleterious effect of power station cooling water discharges upon the fish in rivers and streams. There is a reverse side to this matter. At a place in Lancashire a pond has been warmed for at least eighty years by the effluent water from a textile mill. Recently the mill was electrified and the temperature of the pond which encouraged the breeding of carp and goldfish has fallen and the fish have died. Thus it seems the electricity supply industry can never be the fisherman's friend.

★ ★ ★

A correspondent to the *Glasgow Herald* complained that because of low voltage he was paying for more electricity than he used. Mr. J. Henderson, chief engineer, S.W. Scotland Electricity Board, in a reply, pointed out that the complaint was based on a fallacy and that the meter still registered the actual consumption within fine limits. A third party joined in with the suggestion that unless the Government, "in an endeavour to get something for nothing and so ease the present financial crisis," repealed Ohm's Law, the complainant could rest assured that he would not be cheated.

★ ★ ★

"Cool the Sea to Heat Brighton" is the heading of an article in the *Brighton Gazette* purporting to show how the town could be warmed by means of a heat pump. I am sure that any scheme for lowering the temperature of the sea would be regarded with aversion by Brighton visitors. The possibilities are interesting, though, as set out by the newspaper:—"If a piping system could be laid down under water between the Palace Pier and the West Pier and the Freon liquid passed beneath the sea, it would promptly boil. Then, by the use of a pressure pump, engineers could raise the boiling point from minus 27 degrees to 60 or even 100 degrees Fahrenheit. At this temperature they could boil water and use it for large-scale domestic heating purposes."

★ ★ ★

Farnham Royal (Bucks) should go down in history with the "Village that Voted the Earth was Flat." At a recent public meeting the inhabitants decided against a lighting scheme. Among the arguments put forward were:—(a) that they had been content to do without for over a hundred years; (b) that they did not want the parish "suburbanized"; (c) that torches were cheap; and (d) that the few people who were out after dark could find their way blindfolded to and from the public houses.

★ ★ ★

Two Adelaide men are reported to have been warned off the turf by the South Australian Jockey Club "for proposing to use an electrical battery on horses in a scheme to win large sums of money". The electrification of horses seems to be new, but I am in the dark as to the method of application and the general idea. Was it to spur the animals on to win or to irritate them to lose?

★ ★ ★

According to the *Manchester Evening News*: "Buxton may spend £27 on electricity for 26 council houses at Ferney Dale." This looks like either cut-price contracting or very skimpy installations

Personal and Social

NEWS OF MEN AND WOMEN OF THE INDUSTRY

TO mark his retirement from the Yorkshire Electricity Board, **Mr. A. N. Aikman,** manager of the Bradford district, who joined the former Bradford electricity undertaking in 1928, has been presented with a silver salver by Mr. T. H. Carr, manager of No. 1 (Bradford) Sub-Area, on behalf of his colleagues.

Mr. C. J. Sarjeant has relinquished his managerial appointment in the Control Gear Engineering Department of the British Thomson-Houston Co., Ltd., for reasons of

Mr. C. J. Sarjeant

Mr. C. F. Gimson

health, and is now devoting himself entirely to technical matters. He will continue to represent the company on various control gear committees. He is succeeded as manager of the Control Gear Engineering Department by **Mr. C. F. Gimson,** who was appointed deputy chief control gear engineer in January, 1948. Before going to Rugby Mr. Gimson spent nearly twenty-three years with the B.T.H. Switchgear Works, Willesden, and two years with A.E.I. (India), Ltd., in Calcutta, as supervising engineer. He joined B.T.H. Willesden in 1924, taking the drawing office apprenticeship course, and after spending some years as switchgear draughtsman held various appointments, including those of design engineer, and technical assistant to the superintendent engineer.

Mr. A. L. Howe, district engineer at Boldon (Co. Durham) for the North-Eastern Electricity Board has been appointed district engineer at Jarrow in succession to **Mr. E. W. Gordon,** who has retired. Jarrow district now includes the former Boldon area.

Mr. F. Richardson, A.C.C.S., has been appointed administrative officer with the Uganda Electricity Board. He is at present with the Kirkcudbrightshire undertaking of the S.W. Scotland Electricity Board and was formerly with the Scarborough Corporation electricity undertaking for ten years.

Sir Charles Bruce-Gardner, Bt., M.I. Mech.E., has been elected a vice-chairman of Crompton Parkinson, Ltd.

Mr. M. Gaughan, B.Eng., A.M.I.E.E., has recently been appointed electrical engineer to the Britannia Engineering Co., Luton. Mr. Gaughan was for many years in the Lighting Department of the British Thomson-Houston Co., Ltd., and was responsible for many important lighting contracts, particularly with Government Departments and transport undertakings. He received his technical education at the University of Liverpool, and graduated in 1927, joining the B.T.H. Co. in the same year. He completed an apprenticeship course at Rugby and since then, apart from a short break in the 1930s, has remained with the company, latterly as a senior engineer in the Lighting Department at Watford.

Mr. S. S. Galloway has been appointed northern sales manager for water heaters with Berry's Electric, Ltd. Mr. Galloway served an apprenticeship with the Metropolitan-Vickers Electrical Co., Ltd., at Trafford Park, Manchester, and from 1924 to 1930 he was north-western representative of the Metropolitan-Vickers Supplies subsidiary. He joined Ferranti, Ltd., in 1930, in their domestic appliance department, of which he became sales manager in 1943. In March this year he was appointed assistant sales manager of Ferranti's radio, clocks and domestic appliance department.

Mr. S. S. Galloway

Mr. P. E. M. Sharp, A.C.G.I., B.Sc. (Eng.), has taken up an appointment as industrial officer (electronic equipment) with the Council of Industrial Design. He will be responsible for liaison between manufacturers of electronic equipment and the 1951

Festival of Britain organization, and for that part of the 1951 Stock List dealing with communications equipment, domestic radio and television, remote control and alarm apparatus, industrial electronics and radar. Mr. Sharp was, until recently, with Standard Telephones & Cables, Ltd., where he was responsible for the production of technical publications.

Following the visit of Mr. G. H. Posam, overseas manager of Parnall (Yate), Ltd., to Australia to carry out market research for electric cookers and other appliances manufactured by the company, **Mr. J. A. Gower** has been appointed resident representative in the Commonwealth, in order to provide a closer link with the company's interests in Australia. Mr. Gower's address will be the Oriental Guest House, 11, Milsom Road, Cremorne Point, Sydney, N.S.W.

Mr. J. A. Gower

Mr. H. W. Crowest, formerly showroom manager with the South Eastern Electricity Board, has joined the sales staff of the Revo Electric Co., Ltd. Mr. Crowest was previously with the County of London Electricity Supply Co., and with the London and Home Counties Joint Electricity Authority.

Nearly 600 people participated in the first post-war dinner of the staffs of **W. T. Henley's Telegraph Works Co., Ltd.,** and its associated companies, held at the New Hall of the Royal Horticultural Society, London, S.W.1, on Saturday last. Sir Montague Hughman, chairman of the Henley organization presided, and a number of directors were present. After an excellent dinner the toast of "The Henley Companies" was proposed by Mr. H. J. Hodges, chief labour officer, and Sir Montague Hughman responded. The only other toast was "The Ladies," felicitously proposed by Mr. W. M. Baxter, export manager of the Cable Company, and ably replied to by Miss K. E. Gilbert, the chairman's secretary. This part of the proceedings was concluded by the presentation of the City Livery Cup to Mr. F. W. M. Anderson, general manager, representing the winners, Head Office, by Sir Montague Hughman. Dancing followed and a much-appreciated cabaret show was presented by a bevy of dancing girls and a clever prestidigitator.

Mr. J. C. Deaves, of Huntingdon, has been appointed manager of the Huntingdon Service Centre of the Eastern Electricity Board.

Mr. S. J. Hawke has been appointed to the board of the Pullin Optical Co., Ltd.

As reported in our "Commerce and Industry" section in this issue, the Hotpoint Electric Appliance Co., Ltd., an associate of the British Thomson-Houston Co., Ltd., will, on 1st January next, assume responsibility for the direct manufacture of the electrical appliances that it markets. **Mr. C. W. Stoodley,** who was general superintendent of the B.T.H. Rugby works and sub-factories, was appointed general works manager of the Hotpoint Co. on 1st November last. **Mr. H. Dreghorn,** B.Sc., has succeeded him as general superintendent at Rugby, **Mr. B. E. Pedler** has been appointed planning engineer, and **Mr. L. Sayles** works plant engineer.

Over sixty of their Scottish service station agents were entertained by **Oldham & Son, Ltd.,** at a luncheon held on 17th November, at the Grand Hotel Glasgow, to coin-

Sir Montague Hughman hands Mr. F. W. M. Anderson the City Livery Cup

cide with the Scottish Motor Show. Mr. S. J. Wrigglesworth, director and general manager, who presided, said that this was the first reunion of the company's Scottish agents since the war. Mr. A. Eyre, sales manager, and Mr. M. Smith, technical development liaison officer (Battery Division), also attended from Denton. Each guest was presented with a desk thermometer housed in the actual headpiece of an Oldham miner's cap lamp.

The English Electric Co., Ltd., has appointed **Mr. H. G. Nelson,** A.M.Inst.C.E., A.M.I.Mech.E., A.M.I.E.E., to be deputy managing director of the company. Mr. Nelson will relinquish his appointment as managing director of D. Napier & Son, Ltd., but will retain his seat on the boards of that company, Marconi's Wireless Telegraph Co., Ltd., English Electric Valve Co., Ltd., and English Electric Export & Trading Co., Ltd., and will continue to be in close administrative touch with those companies. **Mr. H. Sammons,** M.I.Mech.E., F.R.Ae.S., has been elected to the board of D. Napier & Son, Ltd., and appointed managing director of that company in succession to Mr. Nelson. **Air Vice Marshal Sir Conrad Collier,** K.C.B., who will take up an appointment with the English Electric Co. on the 1st December, has been elected to the board of D. Napier & Son, Ltd., and will act as consultant to the board of Marconi's Wireless Telegraph Co., Ltd., on the use of radio in the operation of aircraft.

Mr. H. G. Nelson

A large number of shareholders, customers and guests attended a luncheon at the Criterion Restaurant, London, after the recent annual general meeting of the **Watliff Co., Ltd.** The chairman, Mr. W. Martin Hume, F.C.A., said that the company's methods of incentives and human understanding between management and employees did much to produce the results that the Government was so anxious should be general throughout the country.

Obituary

Mr. J. P. D. Coleman, a director of Wild-Barfield Electric Furnaces, Ltd., and its associated company, G.W.B. Electric Furnaces, Ltd., whose death we briefly recorded in our last issue, commenced his electrical career with the National Telephone Co. in 1896, and served under the late Mr. E. P. Barfield, an association which was almost continuous until the latter's death in 1938. After completing his apprenticeship, Mr. Coleman saw a period of sea-going service, and in 1910 joined the cable department of Siemens Bros., & Co., Ltd., later transferring to Siemens Bros. Dynamo Works. During the 1914-18 war he served with the Royal Engineers and afterwards rejoined Mr. Barfield in 1919, becoming works manager in the company formed through the collaboration of Mr. Barfield and Mr. L. W. Wild to manufacture electric heat-treatment furnaces. He was appointed to the board as works director in 1933 and joined the board of G.W.B. Electric Furnaces in 1938. In 1940 he gave up active day-to-day participation in the business, but remained on the boards of both companies until his retirement on account of ill health in 1948.

Mr. B. Higgins.—The death occurred on 28th November, at the age of fifty-nine, of Mr. Bernard Higgins, secretary of the London Division of the British Electricity Authority. Mr. Higgins was personal secretary to the late Sir Eric Geddes from 1917 to 1920, and in the last-mentioned year joined the Electricity Commission, first as personal assistant to Sir Archibald Page, and later to Sir Leonard Pearce. In 1927 he joined the London Power Co., Ltd., of which he became assistant secretary in 1941 and secretary in 1945. He was appointed secretary of the London Division of the B.E.A. in March, 1948.

Mr. T. J. Hudson.—The death is announced of Mr. Thomas James Hudson, which occurred on 22nd November, at the age of seventy-nine. Mr. Hudson joined W. T. Henley's Telegraph Works Co., Ltd., in 1903 as a representative for the Southern Counties and West of England, and he became manager of their Brighton branch from its inception until he retired from full-time employment with the company in 1939.

The Earl of Verulam.—The death occurred in hospital at Newmarket on 29th November, following a car accident, of the Earl of Verulam, chairman of Enfield Cables, Ltd., and Enfield Rolling Mills, Ltd.

Mr. J. R. Bateman, managing director of Meritus (Barnet), Ltd., died suddenly on 8th November.

Mr. W. Winter.—The death occurred at New Barnet on 22nd November of Mr. William Winter, M.I.Mech.E., late of the Victoria Falls & Transvaal Power Co., Ltd.

Will

Mr. H. J. Wagg, O.B.E., consulting electrical engineer, who died on 24th August last, left £47,202 gross (£46,060 net).

Industry and the House

General Election Casts its Shadow

BY F. J. ERROLL,
M.A., A.M.I.E.E., M.P.

PARLIAMENTARY business during the last fortnight has been very quiet and demonstrates that the useful life of this Parliament is really at a close. There was a good deal of truth in Mr. Winston Churchill's remark towards the end of a long and rather fruitless period of question and answer:—"Could the Home Secretary say whether he has got a supply of questions likely to keep Parliament going until the Dissolution?"

The last element of controversy over the Iron and Steel Bill was removed when the Government made plain its intention to submit amendments which would concede the principal points on which the Lords had maintained their independent stand. Mr. Strauss in opening the short debate said that vesting date could not take place on 1st March, 1950, because of the delays which had already been suffered by the Bill. He therefore proposed that the earliest vesting date should be 1st January, 1951, which would place vesting well beyond the latest date of a general election. At the same time, he said he would like the Bill to become law as soon as possible so that the complicated provisions regarding the dissipation of assets could take effect without a prolonged period of uncertainty and doubt.

In view of the strained atmosphere which would surround the month preceding an election he gave an undertaking that he would not approach any individual with a view to inviting him to join the Steel Corporation. So long as a possibility existed that the Corporation might not come into being some men might refuse to join.

Mr. Churchill replied for the Opposition and he stressed the importance of the Government's announcing the date of the election as soon as possible. The amendments were agreed to without a division and on Thursday went before the House of Lords which passed them in less than forty minutes. The same evening the Bill became an Act.

More and more Members are becoming interested in television, and the Postmaster-General is frequently assailed by questions concerning the provision of a service to different areas. Thus, Sir Ian Fraser wanted to know what arrangements were contemplated for towns such as Barrow-in-Furness, Kendal and Prestwick. The Postmaster-General considered that the station at Holme Moss which would be opened during 1951 would give a good service to some of the towns and a fair service to others. Mr. Chetwynd asked about the service for Teesside, and was told that the proposed station near Newcastle-on-Tyne should provide a satisfactory and regular service.

One of the Welsh Members, Mr. S. O. Davies, made a demand for a high-power station in Wales and Mr. Price White made an appeal for North Wales and mid-Wales. Mr. Paling informed the House that the B.B.C. was carrying out local tests to locate the most suitable sites.

After Sir Eustace Missenden's address to the Institute of Transport about the general desirability of large-scale electrification of British Railways, it was with disappointment that the House learnt from a question asked by Mr. Gammans that the application of capital cuts to railway work were now being worked out. How far these will apply to electrification schemes is not, therefore, yet known, but it seems unlikely that they can escape altogether.

Bankside power station will burn fuel oil only, so the Minister of Fuel and Power told Sir Arnold Gridley. Comparative average costs for oil and coal, assuming a 40 per cent load factor were 0.76d per kWh for oil and 0.69d per kWh for coal. These figures had been worked out before devaluation took place and the Minister was unable to say how the relationship might change in the future.

PARLIAMENTARY NEWS

By Our Special Reporter

DURING a debate in the House of Commons on Welsh affairs, Mr. Price-White, Member for Caernarvon Boroughs, referred to hydro-electric development in North Wales. He said this was a matter which was causing contention. They must be prepared to develop their potentialities in Wales, hydro-electric or otherwise, to the full. They must also, after having regard to their own demands, be prepared to share their production fairly and equally with others. But there was grave concern, and properly so, among local authorities, associations and individuals in North Wales about the vastness of this proposal for Snowdonia. He hoped that some form of sensible compromise might be brought about whereby they produced such hydro-electricity in North Wales as they could without the spoliation of some of the most beautiful scenery in the world.

It had not yet been proved that the vast amounts proposed to be spent on this scheme were justified, having regard to the amount of electricity produced. They did not mind producing electricity, provided they could be assured that they would have first priority for the service in their rural areas, for the electrification of farms and businesses. But the spoliation of the countryside to provide extra electricity for Stoke-on-Trent was something to which they would, quite properly, never agree.

Lady Megan Lloyd-George said it was vital that they should have an adequate supply of electricity for industrial and agricultural development in Wales. It was their duty to consider with the utmost care, and without prejudice, the proposals of the British Electricity Authority, and it was equally their duty to see that the priceless heritage of natural beauty in Wales was not impaired.

Mr. Callaghan, the Parliamentary Secretary to the Ministry of Transport, replying to the debate, said he did not dissent from anything that had been said. They had to ensure that the economic development of Wales did not proceed at the expense of spoiling the countryside. He thought that the British Electricity Authority had been very wise in proceeding on the basis of informing public opinion about its proposals before taking final decisions. That seemed very sensible and businesslike. It was clear that the British Electricity Authority would have to go to the House of Commons with a private Bill before it could get sanction to proceed with the work. He was sure that the B.E.A. desired that public opinion should be consulted, and the best possible arrangements made to combine economic development with the preservation of one of the most beautiful spots in the British Isles.

Steel Bill

The Iron and Steel Bill received the Royal Assent on 24th November.

Television Range

Replying to Sir Frank Sanderson, the Postmaster-General (Mr. Paling) said the B.B.C. did not consider it practicable to increase the range of its present television transmitter at Alexandra Palace. The existing range was not limited to 35 miles; it varied in different directions.

Mr. Paling informed Mr. Chetwynd that the B.B.C. expected the proposed station near Newcastle-upon-Tyne to provide a satisfactory and regular television service for Tees-side.

Mr. Paling also told Sir Ian Fraser that the B.B.C. hoped that its television station at Holme Moss, near Huddersfield, would be opened during 1951 and would give a good service in Blackpool, Blackburn and Preston. In Barrow-in-Furness, Kendal, Lancaster, Morecambe and Ulverston, the Corporation considered that a fair service would be given to viewers who were favourably situated for receiving the television wavelengths.

Census of Production

Mr. John Edwards told Sir Waldron Smithers that the Census of Production, which was held under the Statistics of Trade Act, 1947, was designed to provide a general survey of the state of trade and business and to contribute to a satisfactory statistical service for industry. Most firms had completed the Census returns and to excuse the small minority who had failed to comply with their legal obligations would be neither practicable nor desirable; it would reduce the value of the Census.

Vactric Directors

Mr. Erroll asked the Chancellor of the Exchequer what were the names and quali-

fications of the individuals appointed by the Government to the board of Vactric, Ltd.

Mr. D. Jay, who replied, said that no individuals had been appointed by the Government to the board of Vactric, Ltd. The directors who occupied their seats on the board with Treasury approval were all gentlemen of considerable experience in Scottish industry—Mr. J. Paterson, Mr. C. R. D. Brown and Mr. D. W. L. Menzies.

Coal Consumption

Mr. Gaitskell informed Mr. Awbery that in 1939 the steam stations of authorized electricity undertakers generated 25,255 million kWh and consumed 15.03 million tons of coal. The corresponding figures for 1948 were 45,020 million kWh and 27.64 million tons of coal.

Oil Refinery Machines

Mr. Erroll asked the Minister of Labour what steps he was taking to ensure that electrical machines and switchgear imported from America for British oil refinery expansion conformed, where necessary, to the Buxton tests and regulations.

Mr. Isaacs said that the machines and switchgear in question would, when installed, be subject to the requirements of the Factories Acts and of the special regulations made under those Acts. The Factory Inspectorate had already been in touch with the firm concerned with a view to ensuring that there would be compliance with the requirements.

Mine Shaft Sinking

COMBATING the entry of water in any excavation may mean dealing with either an inflow having mere nuisance value or a rush of water of serious proportions. When the National Coal Board undertook the sinking of a new shaft at the Calverton Colliery, Nottingham, it was decided to employ a refrigeration technique to form a frozen barrier surrounding the shaft to prevent the influx of water.

Serious problems had to be solved. Concrete would not set on the frozen walls and a further difficulty was encountered in drilling for shot firing; the compressed air apparatus had to be withdrawn about every twenty minutes and taken to the surface for thawing out. At 100ft down the shaft the air temperature was 22 deg F. and the walls 18 deg F., the sandstone being frozen so hard that progress was difficult and slow.

The General Electric Co., Ltd., was then consulted and to overcome the difficulties three 15 kW industrial unit heaters were attached one above the other to a framework that could be raised and lowered at will. This arrangement has accelerated progress and the rate of boring has been increased by 10 ft per week. The total length of shaft along which this freezing and localized thawing technique has been employed is in excess of four hundred feet. Concrete is now formed at an air temperature of 38 deg F and the compressed air drilling equipment no longer freezes up. The ultimate depth of the shaft will be 1,600 ft.

This heating technique has been developed by the G.E.C. for the National Coal Board to the instructions of Mr. Arthur Wadsworth, N.C.B. sinking and boring engineer, the Calverton Colliery being under the general jurisdiction of Mr. A. Hill, general manager of No. 6 N.C.B. Area, Bestwood, Nottingham.

I.E.E. Utilization Section

FOR the last two years the Utilization Section of the Institution of Electrical Engineers has arranged a dinner, but this session the Committee decided to have an evening conversazione instead to enable more members with their ladies to take part and to afford greater opportunities for social intercourse.

The function took place on 25th November at the Institution building and members and their ladies were received by the Section chairman, Mr. C. T. Melling, the past-chairman, Mr. R. O. Ackerley, and the president of the Institution, Professor E. B. Moullin.

Buffet refreshments were served in the library, and the first item on the programme was a film show which lasted some 55 minutes and included five short documentary films of electrical and general interest, two of them in colour.

There were also a number of interesting demonstrations and exhibits arranged in various parts of the building to illustrate the many aspects of the utilization of electricity. They ranged from an excellent model of Staythorpe power station to both modern and historic domestic appliances.

E.I.B.A. "Target"

THE Electrical Industries Benevolent Association is £3,000 down on its income "target" for the first 10 months of 1949, only £24,418 having been received instead of the figure of £27,500 aimed at.

Subscriptions of £50 and over included in the October income were as follows: *Electrical Review*, £52; Phillips Electrical Ltd., £100; Association of Steel Conduit Manufacturers, £52; B.B.C., £105; Belling and Co., Ltd., £104; and Electrical Apparatus Co., Ltd., £100.

The Codes of Practice

With Special Reference to Electrical Work

By G. E. MOORE, M.I.E.E.

DURING the last war an important extension to this country's written standards was initated. Aware of the quickening need for guides to well-founded engineering and related practice, the leading professional institutions approached the Minister of Works who, collaborating with various other Government Departments, began negotiations which led to the formation of a Codes of Practice Committee in September, 1942.

This Committee has been concerned with civil engineering, public works, building and constructional work, and it has directed the preparation of relevant Codes of good practice in these spheres. Under a chairman appointed by the Minister of Works there have sat representatives of professional and scientific bodies, of the Building Industries National Council and of the British Standards Institution; in addition, assessor members have been nominated by interested Government Departments.

Procedure of Preparation

After some time it became obvious that Codes for other branches of engineering should be prepared. In 1947 the B.S.I. came to an arrangement with the three major engineering Institutions by which such Codes could be prepared, responsibility to be jointly shared by the B.S.I. and one or more of the Institutions, specialist bodies being invited to advise on their particular subjects. The particular Institution concerned initiates a preliminary conference and deals with the drafting of a Code—all in association with the B.S.I., which acts as the publisher of the Codes. The terms of the agreement between the B.S.I. and the "Civils," "Mechanicals" and "Electricals" made it clear that any subject outside the joint sphere of these Institutions may be dealt with by the B.S.I.

To complete this historical introduction, it should be added that in May of this year the Codes of Practice Committee for Civil Engineering, Public Works and Buildings changed to the Council for Codes of Practice for Buildings (Construction and Engineering Services). This restriction of the scope of work is now in force. Thus, so far as electrical Codes of Practice are concerned, there are the "building series" prepared by the Council and those Codes which are prepared jointly by the B.S.I. and I.E.E.

Complementary to British Standards

The part played by the B.S.I. is particularly effective, for this body publishes the Codes after they have received final approval. The Codes complement its own specifications (the "British Standards") and form agreed prescriptions of good practice. The B.S.I.'s main job is the setting-up of engineering and other standards of quality and dimensions; but with and through this work great benefits are associated—for wide adoption in practice of the standards achieves at least the minimum of efficient performance, with simplification, economy, and often a considerable measure of interchangeability.

As the B.S.I. does not prepare a Standard unless a marked desire is expressed for it and then only by general consent, there has tended to be a certain inconsequence and incompleteness in the output of Standards. Of course, as the years have passed the "gaps" have somewhat filled up, though the appearance of related British Standards at widely different times remains a failing. These difficulties are not new; the issue of the British Standard Codes of Practice cannot entirely avoid them.

Quite a number of electrical Codes have appeared since 1942 and their production has followed one or other course. An early Code (B.S. 1086: 1942, dealing with the maintenance of electrical switchgear) was apparently regarded as in the line of British Standards proper, but later, as already described, the Codes began to be treated distinctively. The electrical installation Codes will have their place in a General Series of Building

Codes—the divisions of which relate to the building carcase, building finishes, installation of services (including electricity) and miscellaneous independent installations and equipment.

Thorough Drafting

Something of the thoroughness with which the Codes are drafted can be gathered from the routine for electrical Codes of Practice.

For work on behalf of the Codes of Practice Council the Committee on Codes of Practice for the Electrical Equipment of Buildings (convened by the Council of the I.E.E.) sets up a sub-committee of members knowledgeable in the particular subject. In due course a draft is produced and it then passes through the following stages for "vetting," comments and filling in (as the case may be): the Engineering Services Sectional Committee of the Council for Codes of Practice, publication (as a draft for outside comment) by the B.S.I., Drafting Sub-Committee (for consideration of comments), Electrical Codes Committee (for approval), Engineering Services Sectional Committee (for approval) and Council for Codes of Practice (for approval). The final stage is its publication as a British Standard Code of Practice by the B.S.I.

The routine for the production of a Code prepared jointly by the B.S.I. and the I.E.E. under the special agreement is naturally somewhat difficult. A preliminary conference convened by the I.E.E. Council decides, in collaboration with the B.S.I., as to the desirability of a Code. An appropriate Drafting Committee is formed and a draft prepared which, after provisional approval by the I.E.E. Council and the B.S.I. Electrical Industry Standards Committee, is circulated by the B.S.I. for comment. Later, incoming comments are examined by the Drafting Committee. Final approval having been given by the I.E.E. Council and the B.S.I. Electrical Industry Standards Committee, there follows its publication by the B.S.I. as a British Standard Code of Practice.

The ground covered so far in electrical matters generally can be judged by the subjects. In the "buildings" series there are: provision of service cables in small houses; intake arrangements for flats and multi-occupier buildings; installation of consumers' supply controls; private generating plant (a certain topicality here!); provision of lighting in dwellings (one C. of P.) and in schools (another C. of P.); electrical installations (general); installation of vapour-compression type domestic refrigerators; selection and installation of domestic cookers; protection of structures against lightning; installation of domestic electrical space heating equipment and (quite recently) electrical wiring systems, dealing with their choice, installation and maintenance. Incidentally, the original B.S. 1062/6 (War Emergency) Codes of 1942 for electrical wiring were withdrawn in 1946; the whole subject is now being dealt with by the Electrical C. of P. Committee and by the Wiring Regulations Committee of the I.E.E.

The following three codes are due to the joint I.E.E.-B.S.I. Committee: abatement of radio interference from electro-medical and industrial radio-frequency equipment (one C. of P.) and from motor vehicles and internal combustion engines (another C. of P.) both, in view of Parliamentary interest in the subject, rather topical; and installation and maintenance of flameproof and intrinsically safe equipment.

Mention must be made of codes dealing with the maintenance of switchgear, the use of radio valves, the use of cathode-ray tubes—these having been issued as ordinary British Standards before the introduction of the aforementioned scheme for the preparation of Codes.

Practical Basis

Naturally enough, but still welcome, there is about the Codes a workaday atmosphere that is sometimes missing from British Standard Specifications which are necessarily drafted largely from the point of view of the design office. They are usually quite to the point throughout and are in compact booklet form costing, at the most, a few shillings. Each Code is intended as a standard of good practice. Though perhaps mainly acting for executives and others as agreed guides, or even digests, the Codes have an educational value which should be exploited to the full.

It should be noted that the Codes are not specifications and that compliance with them does not give immunity from

any legal requirements (including local by-laws) which may be attached to a particular application. Each Code, it must be appreciated, is in the form of a set of recommendations. Still, there should never be any hesitation on the part of contractors and others in pointing to the fact that a Code has been observed *and* that it has the backing of the particular professional Institution which sponsored it.

It is the intention that all Codes shall be revised, if necessary, within a few years of each appearance; one hopes that it will be possible to carry out this laudable object and that the Codes will gain rather than lose in their matter-of-fact appeal and usefulness.

Tests, Inspections and Records

Whenever necessary and appropriate the Codes very rightly lay stress upon suitable tests, inspections and record-keeping. For instance, that on "Maintenance of Electrical Switchgear" (a very early Code appearing as B.S. 1086 : 1942) has eight sections dealing respectively with the scope, general items of practical interest and reference, safety of personnel, safety of equipment, equipment, apparatus, protective systems and apparatus, and insulation testing for the detection of incipient breakdown; examples of permit and maintenance cards are given. The booklet is throughout informed with practical sense and is worth many more half-crowns than the one charged.

Another on "Protection of Structures against Lightning" (C.P. 326.101) gives authoritative guidance which is very welcome in view of the fact that fresh general information on the subject has been lacking for over 40 years. After dealing with a variety of means and structures there are useful recommendations on corrosion, materials and dimensions, fixing, inspection, testing and records.

The Code (C.P. 1003 : 1948) dealing with the installation and maintenance of flameproof and intrinsically safe electrical equipment for industries other than coal mining is another fairly recent publication. In Section 6 inspection and testing are treated and Section 7 concerns maintenance, with recommendations covering staff, inspection and testing, care of flexible cables, periodic mechanical inspection and electrical tests, and precautions against corrosion.

These three Codes have been picked out because, in the writer's view, they are not only eminently practical, but lay special (and necessary) stress upon *maintenance*. Some executives and operatives have scant regard for the service requirements of equipment; yet a marked gain in efficiency and dependability, and an increase of useful life, follow consistent maintenance work—even when equipment has been ill-chosen in the first instance. Codes of Practice as informed as those just mentioned may well have a powerful effect in the industrial world and bring considerable long-term advantages if acted upon.

These remarks may appear extravagant, but look at to-day's conditions. A dominant issue is the shortage of material and labour in production, the home market being kept "short"—what we are using now, or what we manage to obtain, must give as extended a service as possible. The fact that plant may "on paper" be obsolescent does not sentence it to the scrap-yard. The cynical reflection that "anyway, we can easily replace it" justifies less than ever undue cutting of first cost and quality, and of service expenses.

Educational Value

Again, there is a grievous dearth of generally distributed information, especially of a practical workaday nature; textbooks and the like (of whatever kind) are, as with everything else, very scarce. Yet, far too many young operatives have had, or must suffer, a shortened and patchy training period—quite likely never getting the benefit of long contact with a shrewd old workmate.

These circumstances, with their peculiar aggravating and paradoxical reactions, are being mitigated by the Codes of Practice. A great increase in the circulation of all Codes (general as well as electrical) is desirable; they are to the point and in brief compass; the ruling paper shortage should not be pleaded in opposition.

They must be made known to all ranks and be readily available. For this the aid of technical journals, trade union, technical colleges, works and contractors should be enlisted. Wide and effective

publicity would be called for; announcements by B.S.I. year book and monthly bulletins are quite inadequate for the proposed purpose, indeed leave much to be desired to-day. It is particularly necessary that the scope and main details of the whole Code of Practice programme be considered and made evident from time to time; for subjects apparently quite different may be related, e.g., sound insulation schemes and wiring practice.

More and more aspects will call for treatment as time goes on and the inclusion of unusual, or seemingly-minor, subjects should not necessarily be disallowed or withheld because of lack of demand *if* it serves to complete a series. Above all, though there must necessarily be a technical approach, let the Codes continue to be simple and direct in form and language—the involved and pedantic being rigorously eschewed—and pictorial aid should be used to the utmost. Executives alone cannot make the Codes; by co-option to Committees and by full discussion "on the job," experienced technicians and operatives should play an adequate part in the drafting work and in the invited criticism.

Low Price Desirable

A last, but supremely important, point is the price to the public of a Code of Practice. It should be low and one shilling would be an attractive uniform charge; a big circulation is assumed, the low price being a major inducement. Such prices as that of C.P. 321 for "Electrical Installations" (namely, 7s) are emphatically to be deplored. The I.E.E. shows what can be done by its low-priced, yet relatively massive, Regulations for the Electrical Equipment of Buildings (2s 6d in paper-backed form).

Our British Standards Institution is a unique organization; so far as one can gather, there is no body quite as effective elsewhere in the world and its Standard Specifications have long been accepted pointers to dependable and economic products. The B.S.I., with the Standard Codes of Practice, can rise to a fresh height of vital endeavour. It may well be that these very Codes will be a potent aid in the future, teaching and encouraging two qualities which the world sadly needs, yet undervalues—craftsmanship and reliable work.

Machine-Tool Testing

RECENT experiments in the testing of machine tools were described in a paper read at the Manchester Association of Engineers by Dr. D. F. Galloway (director, Production Engineering Research Association), who explained that the investigations of the P.E.R.A. were financed and broadly controlled by both makers and users of machine tools.

Most accuracy tests could be done with conventional measuring equipment, but certain errors were so complex that special instruments had to be devised. For instance, for testing the leadscrew and its gearing with the main spindle of a lathe, equipment had been developed by the Metrology Division of the N.P.L. which electrically recorded the pitch errors in the screw-cutting mechanism and enabled the causes of the errors to be identified.

It had been disturbing to find that little definite data was available on the efficiency of machine tools. When making this determination, caution must be exercised in measuring the electrical input power. A dynamometer wattmeter was used with series current coils and shunt voltage coils in two phases of the supply, the voltage coils being connected across to the third phase. Both machine and overall efficiencies fell off at the higher spindle speeds. This increase of power loss was attributed to the large diameter of the bearings, ball or roller, which was essential to the rigidity of the main spindle.

Thermocouple tests of bearing temperature had shown how expansion of the headstock casing would result in undersized components if the tool were set to cut the correct size when the machine was cold or only just warm. For measuring radial displacement of bearing races, movement of a "follower" was amplified and passed to an oscillograph, or average meter.

Equipment for measuring vibration of an amplitude as small as 0.000001in and for separating the total vibration into its several components, consisted of a pick-up of seismic mass type forming an air-gap condenser. Variation of its capacity was converted into a proportional voltage variation by means of an oscillator and frequency demodulator, then amplified and passed to an oscillograph and frequency analyser.

Mining Area Supplies.—Consett and Easington Councils have asked the North Eastern Electricity Board to take over electricity supplies in their areas at present provided by the Northern Divisional Coal Board. The Councils state that the N.C.B. service is inadequate.

RECENT INTRODUCTIONS

Notes on New Electrical and Allied Products

Electric Washtub

THE "Rosslow" electric washtub, though costing no more than the separate units, viz. washtub and wash boiler, saves approximately 30 per cent in space, simplifies filling and emptying, avoids overflowing, and is in various other ways more convenient.

A 4 kW "Barlow" element brazed into a hot brass pressing is arranged to give three heats. Access to it is easily obtained from the inside of the tub by removing a perforated chromium-plated cover and unscrewing a nut securing it to the sump. A bonding and earthing strip is provided for connecting to the cold water pipe. An automatic thermal cut-out operates if the element is not covered with water.

The complete equipment measures 48 in by 20 in by 15 in overall and is supported on cast-iron pillar legs with bearers to wall. A galvanized cast-iron wringer fixture and a combined skirting and pipe box are provided, together with hot and cold copper supply pipes and chromium-plated taps assembled ready for fixing to the wall.

The apparatus is obtainable from DUNCAN LOW, LTD., 299, Bell Street, Glasgow.

Photo-Electronic Relay

A highly sensitive current detector, which through the medium of a photocell and amplifier operates a heavy-duty relay, has just been placed in the market by ELECTRONIC INSTRUMENTS, LTD., 17, Paradise Road, Richmond, Surrey. An important feature is that, unlike the more conventional moving-coil relay, it is possible by means of a single control to set the operating point at any value between zero and 200 μA. The sensitivity of the device, or the change of input current required to operate the relay, remains constant over the entire range and corresponds to one per cent of the full-scale current. By means of appropriate shunts, the input current can be extended up to 2 A.

The unit is robustly constructed and is intended for continuous operation under factory conditions. It is housed in a steel case which can be fixed to a wall, and the front of the instrument, which carries a glass panel, hinges open to allow access to the controls.

Fluorescent Tube Checker

An addition to the range of "Windsor" instruments made by TAYLOR ELECTRICAL INSTRUMENTS, LTD., 419-424, Montrose Avenue, Slough, Bucks, is a fluorescent tube checker, model 525A, which can be used for finding faults in the six common sizes of fluorescent tubes in present-day use.

The instrument is used with an adaptor to replace the canister-type starting switch. The starting current and running voltage of the tube under test are indicated on separate switch positions, colour arcs being provided to show the normal limits for these readings. Manual starting enables starting faults to be rapidly diagnosed.

Two a.c. ranges of 0-300 mA and 0-1,500 mA, together with an a.c. voltage range of 0-300 V, are also available by attaching a pair of test leads.

Bedlamp

The "Tamsa" bedlamp, manufactured by AUDIGRAPH, LTD., and marketed by Hugh S. McCullach & Partners, Ltd., 93, Regent Street, London, W.1, can be fitted anywhere without scratching the furniture or, by removing the rubber-lined

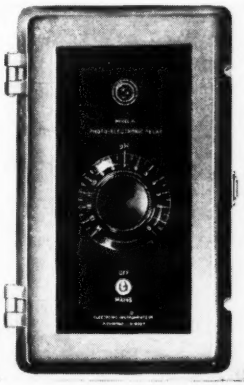
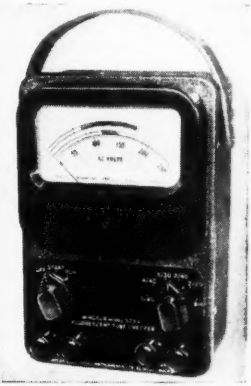
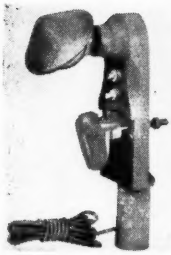


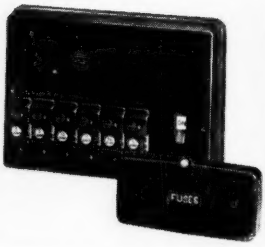
Photo-electronic relay



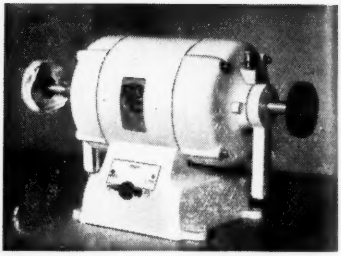
Fluorescent tube checker



'Tamsa" bedlamp



"Wylex" consumers' control unit



"Cub" two-speed dental lathe

clamp and substituting two small screws, it becomes a permanent fixture. For use as a nightlight the shade may be directed upwards and the light can be dimmed by two-thirds. Complete with special 15 W lamp and 9ft of flex, it is available in a choice of nine colours at 49s 6d including purchase tax.

Consumers' Control Unit

A consumers' control unit, which is designed in such a way as to facilitate stockholding by the trade, is announced by GEORGE H. SCHOLES, LTD., Wylex Works, Wythenshawe, Manchester. It comprises a 60 A double-pole a.c. switch, six single-pole fuses and a neutral bar housed in a black moulded case 9¼in wide, 6⅝in high and 3½in deep.

As the units can be supplied with contact shields and fuse bridges separately and the base is the same whatever combination is required, the unit can be made up from stock items as the need arises; 5, 15 and 30 A fuse bridges and contact shields are available.

Lightweight Grinder

Weighing only 12½ lb and being extremely well balanced, a 4 in hand electric grinder made by WOLF ELECTRIC TOOLS, LTD., Pioneer Works, Hanger Lane, London, W.5, has ample power to maintain the correct surface speed on all the grinding, buffing and polishing operations for which it is suitable.

The main gear in this tool is pressed on to a resilient rubber mounting which is in turn fitted to the main spindle. Thus, all shock loads are absorbed and are unlikely to cause damage. The motor is rated at 775 W and the tool can be supplied for operation from all standard a.c. or d.c. mains supplies.

Dental Lathe

A two-speed dental lathe for light buffing and grinding work has been introduced under the trade name of "Cub" by BROOK MOTORS, LTD., Empress Works, Huddersfield, Yorks. The motor shaft is designed so that false noses can be fitted, and two handles are provided to assist in their ejection.

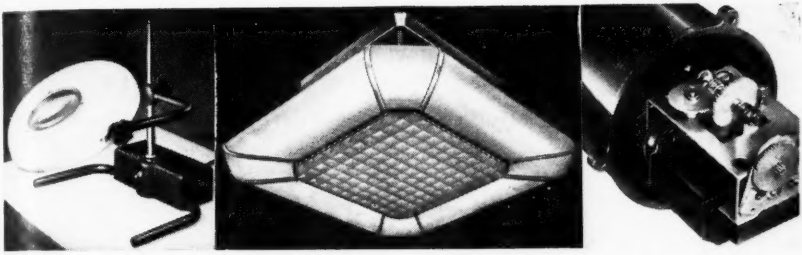
On 50 c/s mains the two synchronous speeds are 3,000 and 1,500 r.p.m.; 2,900 and 1,440 r.p.m. on load. The standard voltages are 200-210, 220-230 and 240-250, but other requirements can be satisfied if necessary. The motor is mounted on a cast iron base to which a rotary switch is fitted.

Industrial Magnifier

The visual discomfort usually associated with the use of magnifying aids is claimed to be greatly reduced in the industrial magnifier (EDM105) which has just become available from ENGINEERING DEVELOPMENTS (ENGLAND), LTD., 50, Pall Mall, London, S.W.1. It incorporates a "Transpex" aspheric lens (developed and produced by Imperial Chemical Industries, Ltd.) in conjunction with a 30 W circular fluorescent tube. Strain occasioned by the brightness contrast between a highly illuminated lens field and a dark surround is obviated by the use of a translucent reflector. The 5in diameter lens permits binocular vision and provides the true stereoscopic image so essential for the examination of small parts.

The fluorescent lamp surrounding the lens gives a shadowless field of illumination of

Wolf portable grinding, buffing and polishing tool



Industrial magnifier | "Atlas" louvred lighting fitting | Synchronous motor unit

about 200-250 ft candles intensity and operational discomfort due to heat is entirely absent.

Louvred Lighting Fitting

A new "Atlas" lighting unit, No. E49, intended for the illumination of banking halls, department stores, cinema and theatre foyers, etc., incorporates eight 4ft 40 W lamps in two rows on four sides behind the diffusing screens and six 3ft 30 W lamps above the central louvres. A special feature is that the dark areas usually associated with fluorescent fittings are avoided.

Since this fitting is normally employed for high mounting, great care has been taken to facilitate maintenance. The outer diffusing screens are easily removed to expose the lamps and the central louvre tray may be dropped down on safety chains to obtain access to the 30 W lamps. All "quick-start" units are contained within the main fittings, chokes and capacitors being in the control gear box supplied with the fitting, which is obtainable from THORN ELECTRICAL INDUSTRIES, LTD., 105-109, Judd Street, London, W.C.1.

Small Synchronous Motor

A small synchronous motor enclosed in a neat moulded case has just been placed on the market by TIME SWITCHES AND INSTRUMENTS, LTD., 5, Victoria Street, London, S.W.1, as a unit suitable for building into manufacturers' apparatus. It is a high-torque, self-starting, clock-type motor and can be supplied for any voltage with gearing to suit individual requirements.

Revo boiling table with two circular plates

Portable Boiling Table

The "Twin" boiling table just brought out by the REVO ELECTRIC CO., LTD., Tipton, Staffs, is equipped with one 8in 1.8 kW boiling plate and one 6¼in 1 kW plate, each controlled by 3-heat switches. Constructed in heavy gauge sheet metal, the unit is finished in green vitreous enamel with chromium-plated bead. A drip tray is neatly concealed inside and the provision of heat-insulated feet renders the apparatus suitable for use on any normal kitchen table. Two black moulded handles enable the unit to be readily carried from place to place, connection to the electricity supply being by means of standard plug and socket. Overall dimensions are: length 23in, width 14in, height 3¾in. The price is £7 10s.

Precision Speed Indicators

For certain applications, mechanically operated speed indicators are not sufficiently accurate. The BRITISH THOMSON-HOUSTON CO., LTD., Rugby, has, therefore, developed and is marketing a series of standard instruments for speed ranges from 0-1,000 r.p.m. up to 0-48,000 r.p.m. and with an accuracy of within ±0.1 per cent.

These "Maxwell" indicators are essentially frequency meters which operate on the Wheatstone bridge principle, one arm of the circuit being replaced by an accurate mica capacitor, which is charged and discharged through a rapid-acting relay. The number of charges of the capacitor per second is dependent upon the frequency transmitted from a generator connected to and driven by the shaft of which the speed is to be measured. Generator frequency may be up to 250 c/s, and the components are arranged so that the capacitor becomes fully charged. Thus the mean quantity passed to the measuring circuit in any small

'Maxwell" precision speed indicator (B.T.H. Co.)

period of time is proportional to the speed of the driving mechanism.

The instrument, which operates from 230-250 V mains, is arranged for flush panel mounting, the metal case measuring 14½in wide, 8⅛in high and 10⅞in deep.

Bi-Pin Lamp Holder

An alternative type of holder for bi-pin fluorescent lamps is now being produced by A.B. METAL PRODUCTS, LTD., Ludgate House, 107, Fleet Street, London, E.C.4. It incorporates spring-loaded sockets to ensure positive contact under all conditions, and the boss on the holder is also sprung to take up the variations in length between different makes of tubes. The main body of these holders is of white moulded material and they are available to manufacturers only.

Electric Lighters

A mains-operated cigarette lighter now being manufactured by KRIVERT, LTD., 33, Sussex Place, London, W.2, measures only 3¾in by 2¼in, and is available in several colours, including cream, maroon, green and black. The heating element has a loading of about 200 W. Models are available for use on voltage ranges of 200-250 and 100-130, the price being 13s 6d plus 6s purchase tax in the United Kingdom. A car type, made for operation on either 6 V or 12 V, is priced at 15s 6d plus 6s 11d purchase tax.

Also being manufactured by the same company is the "Krivert" electric gas-lighter, designed for use on 200-250 V and 100-150 V a.c. It is fitted with a replaceable 1.5 V screw-in gas-lighter element, and a small transformer is housed in the pistol-grip moulded handle. Available in cream, pastel green and amber shades, the lighter, complete with three-core flex, retails at 21s plus 5s 3d purchase tax to United Kingdom buyers.

Marine Fan Controller

Marine fans which are driven by 110 V or 220 V d.c. motors of not more than 1 h.p. can be controlled by a well-designed unit which is now available from BROOKHIRST SWITCHGEAR, LTD., Chester. Both two- and three-speed types are manufactured and they incorporate snap action roller switches with all contacts totally enclosed. The stationary contacts are integral with the outer terminals and are contained in an outer housing of heat-resisting moulded material, while the moving contacts, of the roller type bridging two fixed contacts, are carried by an internal rotor actuated through a square steel shaft by the external handle. The units are enclosed in bulkhead, ventilated drip-proof cases with four external fixing lugs, the overall dimensions being 10in by 10in by 6in.

Plastic Fixing Plugs

The plastic fixing plugs introduced by HEWIT WALL PLUGS, LTD., 4, Curzon Place, Park Lane, London, W.1, can be used in any material, concrete, plaster, brick, wood, glass, rubber, etc. Though tough, the plastic material is pliant and the fluted design permits the plug to be compressed for insertion into a close-fitting hole. No special tools are required for fixing and the plugs can be cut with a pocket knife and do not split or fray. It is claimed that they resist weather, water, heat and acids; will not rot or age; and can be unscrewed and rescrewed without any loss of holding power. A range of drills is available.

Bi-pin lamp holder

Krivert cigarette and gas lighters

Brookhirst marine fan controller

Correspondence

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents

"This Earthing Fetish"

I WOULD like to endorse what Mr. T. C. Gilbert has to say about "This Earthing Fetish" without necessarily supporting his conclusion of an earthed system's greater danger of fire risk. In fact, almost any circuit can generate a lot of dangerous heat in certain circumstances without operating the usual protective devices based on excessive current flow.

After a considerable experience of all types of installations, possibly not so extensive as Mr. Gilbert's, I am of the opinion that the best protection is achieved by the automatic isolation of a circuit when part of the current returns through a path other than that intended for it, or, secondly, by a sensitive device to isolate the circuit if the earth becomes alive; both of these system are the basis of the earth-leakage trip. What is then important is that this form of protection shall be more cheaply applied to an insulated system.

In a lecture to the A.S.E.E. at Glasgow I outlined this type of installation and demonstrated that it could save up to one-third of the total labour and material cost on certain types of work, its disadvantage being the cost of surface fixing, this point often rendering aluminium conduit a more attractive system than it superficially appears to be.

Mr. Gilbert possibly has the "Gilflex" system in mind; the cheap fixing of this conduit depends upon the provision of architect-made fixings in the form of concrete hangers, troughs, or ledges.

Aylesbury. W. E. EDGAR.

Sales Engineers

THE letter from "Surprised" recalls to mind the old quip that the design engineer and sales engineer have a common education and training but by the nature of their later divergence the one tends to specialize until he knows all there is to know about nothing, while the other expands until he knows nothing at all about everything.

It is surely unfair to imply that reputable firms do not maintain an adequate staff of keen and technically competent sales engineers readily available to their customers. As both a buyer and a seller, I gladly acknowledge a lot to these men, who so willingly and co-operatively act as unpaid mentors and minor consulting engineers on problems and plant, often far removed from their own interests.

The salesman—usually "ex-works" and *promoted* to his position—is too often expected, with evidence woefully incomplete or contradictory, to make an instant decision on points which the omniscient "works" browse upon for days, notwithstanding their access to records and drawings and specialist engineers.

Most firms are anxious to send a good man to see a good man, but competent sales engineers—like competent designers—are in short supply and expensive to maintain, so the purchaser can help by seeing that the reception is worthy of the suitor.

The purchaser whose response is limited to "lower price received" or "we don't want any battleships (or what-nots) today," or "too busy to see anyone" is perhaps, responsible for some firms employing grade 2 salesmen for exploratory purposes and this tendency on both sides is to be deplored.

*London, S.W.*1. E. P. LUCKING.

YOUR correspondent "Surprised" complains of the generally low standard of salesmanship of representatives; "Director" of lack of the old spirit of adventure and initiative, killed perhaps by the new "social security." Maybe there is a third side.

I am a technical representative, a British-born subject, but Swiss trained, with practical and university training. Because I was manager of a factory during the war years and am now 47 years of age I am considered too old by most

firms. I am selling to-day lamps, fluorescent and other electrical fittings, and am doing quite well. But it was only by hard work and working long hours I succeeded in building up a connection in a territory which had been utterly neglected by the firm I represent. There is just one more point. A firm cannot establish a good name or reputation by having a new representative on the territory every three months. A representative certainly will not do his best on being told he is the third man who has called during the last six or nine months. It sometimes takes from three to six months before the first order materializes, and by that time the poor representative is already trying his luck somewhere else and the personal contact he has made is lost to the firm.

I am still looking for a job where technical knowledge, sales ability and spirit of adventure can be put to better use than at present, but I am certainly not going to write letters in answer to box numbers, disclosing my personal affairs to any Tom, Dick or Harry. Firms of repute don't have to hide behind box numbers; only those which continuously change representatives, or firms unable to sell now the junk they produced whilst there was a sellers' market.

DISGUSTED.

"Christmas Boxes" for E.I.B.A.

AS E.I.B.A. is £3,000 below its income target figure for the current year, you may care to make mention in your journal of the fact that one response to the appeal of our President, Mr. E. C. Holroyde, for additional support from electrical companies for E.I.B.A. has been the receipt of a cheque for £500 from British Insulated Callender's Cables, Ltd.

Many other electrical companies have also responded in a very generous spirit and it is hoped that others will too, before the year end, in order to save E.I.B.A. from having a further deficit again this year. Five more "Christmas Boxes" like this and E.I.B.A. will be able to enter the New Year out of debt.

H. SENIOR FOTHERGILL,
Secretary, Electrical Industries Benevolent Association.
32, Old Burlington St.,
London, W.1.

Remote Indication Methods

IN a paper read before the London Students' Section of the Institution of Electrical Engineers on Wednesday, Mr. R. J. Redding outlined some of the electrical methods of remote indication and discussed a number of the problems associated with the design and application of such equipment. He distinguished remote from distant indication by explaining that the former implied the use of a device additional to the primary indicating instrument, a "transmitter" translating the information given by that instrument into an electrical quantity which operates the "receiver" over pilot wires.

Remote indication is used by three types of organization—the self-contained, like the power station; those with isolated elements, water undertakings being an example; and finally widespread public utilities employing operational control. Distances are small in the first case, pilot wires are easy to run, and regular maintenance is possible, so cheap and simple methods are desirable. In the second case reliability is the primary requirement as some sections may operate unattended. The pilot lines are difficult to run, and preferably one pair should suffice for indication, control, signalling and telephony. The third type of system employs automatic telephony techniques.

The simplest system uses a potentiometer as a transmitter with a voltmeter or ohmmeter as receiver. Contacts are a likely source of trouble, and an auxiliary motor is necessary to drive the transmitter. A development of this method balances the originating torque by that due to the transmitter current, but in this case the primary instrument does not act as an indicator.

Various a.c. inductance methods can replace resistance systems when fire and explosion hazards dictate the elimination of contacts. In one method a specially shaped metal loop is used as a variable coupling between magnetic fields, which can be attached to switchboard instruments without affecting their accuracy, and because of its reliability it is suitable for the second type of organization.

When the loop resistances of the pilot wires exceed thousands of ohms, carrier methods may be necessary. One system uses a variable condenser as the transmitter, another a light scanning device. Both systems, being electronic, can be employed on trunk telephone circuits including repeaters, or by superimposition on power lines via suitable terminal equipment. With these systems radio links are also possible.

Energy Resources

Their Effects on Human Affairs

THE 36th Thomas Hawksley Lecture was delivered at the Institution of Mechanical Engineers in London on 18th November by Dr. A. Parker, Director of Fuel Research, Department of Scientific and Industrial Research.

The lecturer commenced by pointing out that the annual rate of increase of world population was now about 20 million or nearly 1 per cent of the total. Growing population and improvement of average standards of living were certain to increase the demand for energy in the forms of heat and power, which would necessitate wise planning with the object of ensuring the economical use of available energy resources in the best interest of mankind.

Coal and Oil Consumption

It would be necessary to see that particular types and qualities of coals were allocated to the uses for which they were specially suited, so that they would not be squandered for purposes for which other more plentiful coals could be satisfactorily employed.

Since the beginning of historical records the total quantity of coal that had been used was about 85,000 million tons and the total quantity of petroleum used was about 9,000 million tons. The outstanding facts were that of these totals one-half of the coal had been used during the last 30 years and one-half of the petroleum during the last 10 years. These were enormous quantities of irreplaceable fuels to be consumed within the relatively short time of the last 50 years.

The lecturer then proceeded broadly to review existing resources and present rates of production. The general conclusion was that, taking the world as a whole, the reserves of solid fuels, mainly coals, would be sufficient for 2,000 years or half that time if the rates of production and utilization steadily increased in that time to twice the present rates. The reserves of oil and natural gas, even allowing for the discovery of additional resources, might not last for more than 50 years. Coal reserves in Great Britain which could be economically won could not be relied upon for more than 250 years; peat in suitable form had so far been relatively costly; reserves of petroleum and natural gas were negligible; reserves of shale oil were no more than five times Great Britain's annual consumption of oil. In general, the position of Great Britain was more favourable than that of most other Western European countries.

It was not possible to estimate reserves of materials that might be used as sources of atomic energy, neither was it possible to estimate the quantities of vegetable and animal waste and by-products, including alcohol and methane that might be obtained for use as fuels, but the total would probably be small by comparison with world requirements.

Roughly one-half of the world consumption of wood was for fuel. The forests of the world might provide in addition to timber fuel, wood equivalent to between 380 million and 670 million tons of coal a year. Wood used as fuel during the last 20 years had been equivalent to about 200 million tons of coal a year.

Potential Water Power

The potential annual production of electricity from non-tidal water power was equivalent to the thermal energy of 750 million tons of coal a year, or 375 million tons of coal used to generate electricity at 20 per cent efficiency. The installed capacity was equivalent to 165 million tons of coal a year at 20 per cent efficiency, or about 4 per cent of the potential capacity.

Tidal power schemes had been considered with an estimated annual production of 10,000 million kWh; this quantity of electricity generated in steam stations would require 526 million tons of coal a year. The quantity of electrical energy generated from water power in Great Britain was equal to that from coal-

fired stations burning 750,000 tons of coal a year.

Of the world's consumption of fuel and energy, 10 per cent was as food for the people, 47 per cent as coals and lignites, 23 per cent as petroleum, 5 or 6 per cent as natural gas, 7 per cent as wood, 5 or 6 per cent as water power and 1 or 2 per cent from miscellaneous sources. By comparison with the world average of the equivalent of 1.4 tons of coal per person annually, the figure for the United States was about 7 tons and that for Great Britain roughly 4 tons. Thus, those countries with the greater fuel and energy consumption in relation to size of population had the higher average income or prosperity.

While resources at present rates of production and utilization might seem sufficient for world needs for many centuries, it must be remembered that they were not equally distributed in relation to the requirements, therefore there were many large areas in which energy could not yet be provided economically and where fuel shortages were acute.

In spite of advances the average efficiency of utilization of fuel and power resources was still well below 20 per cent as ordinarily measured.

Determined efforts must be made to improve this figure in order to reduce waste and enable more power to be made available without unduly rapid depletion of the irreplaceable fuels which were most easily accessible, otherwise the difficulties would progressively increase.

Power Supply in France

From Our Paris Correspondent

FRENCH electricity production is increasing but consumption is beating all records and despite fairly heavy and constant rainfall there is talk of a second day without electricity weekly.

Consumption has now reached 95 million kWh daily, with thermal plants supplying 62 million and hydraulic power 31 million, 2 million kWh being imported. Water in the barrages has increased considerably and in a few weeks new installations are expected to enable thermal plants to produce 70 million kWh, when production will pass the 100 million kWh mark daily, provided hydraulic production is maintained.

Owing to the disastrous effects on industry caused by cuts made without warning, a new emergency programme has been drawn up by which a single cut will be made, possibly of long duration and possibly even lasting all day, in addition to the regular day without electricity already in force.

At the same time, penalties for infractions of the rules for illuminated signs and shop windows have been published. In the first case the penalty is cutting off of electricity for seven days, in the second for fourteen days and for a third offence a month.

The Ministry of Industrial Production has indicated that the long spell of dry weather has cost Electricité de France 10 milliard francs for supplementary coal. It is also stated that domestic consumption varies between 25 and 30 per cent of total electricity consumption, while the railways' consumption amounts to between 4 and 5 per cent. A suggestion that imports from Switzerland and Germany should be increased has been rejected as impossible.

The wet weather has given hydro-electric engineers more hope. For over ten years, barrage water levels had never descended below 42 per cent of maximum capacity. This year they fell to 33 per cent. To ease the restrictions, the high proportion of power supplied by thermal plants against the low hydro-electric production would have to be reversed, thermal plants being already overworked and worn.

Meanwhile some newspapers are carrying on violent campaigns against what they term the mismanagement and lack of foresight which has led to the present position. Monsieur Albert Caquot, President of the Committee for French Power Equipment, has backed the complaints by saying that although France lacks electricity no new equipment has been decided upon for the last two years. He points out that France is one of the most favoured countries in power resources.

Electricity problems in the North of France are expected to be practically solved early next year when new thermal plant comes into service. Additions include a second 50,000 kW group at the Harnes plant, 25,000 kW to be supplied by the Sequedin group, 50,000 kW by the new Comines plant and 40,000 kW by the first Lourches group.

A total of 68 milliard francs has been allocated to Electricité de France (which controls the nationalized electricity service) from Marshall Aid funds in 1949.

Commerce and Industry

Plumber Jointers' Wages
T.U.C. Economic Policy

THE Joint Industrial Council for the Electrical Cable Making Industry announces that at a meeting of the Standing Joint Committee on Plumber Jointers and Plumber Jointers' Mates, held on 15th November, it was agreed to recommend to the Council that the rates of pay for plumber jointers, both in London and in the country, shall be increased by 1d per hour with consequential increases to plumber jointers' mates and to youths and boys. These increases will come into effect on the third pay day in December in respect of the period for which payment is made on that pay day. As the Council will not meet until 21st December, in order to avoid delay, the chairman, with the concurrence of the joint secretaries, has authorized the implementation of the above recommendations, confident that they will be accepted by the Council at its December meeting. With the addition of this increase of 1d per hour, the new rates for plumber jointers will be:—In the London area (within a radius of 18 miles of Charing Cross) 3s 3d an hour (basic 2s with a bonus of 1s 3d) and throughout the rest of the country 2s 11½d an hour (basic 1s 9¾d with a bonus of 1s 1¾d.

Crewkerne Traders' Exhibition

At a recent Traders' Exhibition at Crewkerne, organized in conjunction with the town's Shopping Week, the South Western Electricity Board's exhibit was based on the "Cook by Electricity" theme. The Crewkerne District staff were responsible for an ingenious adaptation of the Board "mark" showing "South Western Electricity" as "the key to kitchen happiness." A popular feature was the continuous showing of E.D.A. films and by arrangement with the local education authorities, special showings were attended by several hundred of the older pupils. During the Shopping Week, the Crewkerne Service Centre presented a window display which compared ancient and modern cooking methods.

Zinc Price Reduction

The Ministry of Supply has announced that from 23rd November the price of zinc has been reduced by £2 to £85 10s per ton. The zinc oxide manufacturers have also announced that from the same date the prices in lots of not less than two tons, delivered buyers' premises, of zinc oxide, has been reduced by £1 15s. The new prices are: Red seal, £82 5s.; green seal, £83 15s; white seal, £84 15s.

Birmingham Wholesalers' Showrooms

New and extensive showrooms are planned by Electrical Components, Ltd., at their recently acquired extensive block of premises at the corner of Ludgate Hill and Lionel Street, Birmingham. The first section, covering 6,000 of the 40,000 sq ft of floor space eventually to be used, was opened on 14th November by Mr. S. Dickinson, president of the Electrical Contractors' Association, supported by Mr. S. Watkins, of Birmingham, the vice-president, in the presence of a representative

A section of the new Birmingham showrooms of Electrical Components, Ltd.

gathering of local officers and members of that organization. The display includes a comprehensive range of decorative and commercial fittings, domestic appliances and radio and television receivers, including a television viewing room. As soon as conditions permit, the scheme will include commercial and industrial showrooms for the permanent display of individual manufacturers' products.

G.E.C. Publicity in Argentina

The General Electric Co., Ltd., does a considerable trade in Argentina, and to assist in expanding its export trade to that country, the company's Argentine subsidiary has erected sixty poster panels 23ft by 11ft in prominent positions in Buenos Aires to draw attention to G.E.C. radio products. Simultaneously, window displays were arranged in the capital and towns of the interior. The slogan on the poster reads "Hear as though you were seeing."

One of the G.E.C. posters on radio products exhibited in Buenos Aires

British Television Equipment in America

Among the television equipment demonstrated by Pye, Ltd., in Washington last month was the multi-core television camera cable produced by British Insulated Callender's Cables, Ltd. This single cable, with a diameter of less than seven-eighths of an inch, has been designed to carry not only video signals, but all the control signals, power supplies and telephone circuits required for outside broadcasts. It is, therefore, the only link necessary between the camera and the control van, and enables almost unrestricted movement of the camera for distances up to 1,000ft. The cable is normally supplied in 200ft lengths, specially designed couplers being supplied which enable the lengths to be connected instantly with all the circuits correctly disposed and screened.

Marine Radio Interference

A recently published British Standard (B.S. 1597:1949) specifies the permissible limits of radio interference, for frequencies up to 30 Mc/s, which must be satisfied by the electrical appliances and installations provided in a ship. Requirements are laid down relating to the radio receiving installations, the construction of the wireless room, the wiring installation and electrical machinery. Notes are given on the components used for suppression and tests are specified. The appendices deal with items of the electrical equipment of ships likely to cause interference and with the principles and methods of suppression. Diagrams of suppressors are included.

It is understood that a radio interference measuring set, designed by the Electrical Research Association to meet Admiralty requirements in H.M. Ships up to 40 Mc/s, is being manufactured by Electric & Musical Industries, of Hayes, Middlesex. The Lords Commissioners of the Admiralty do not object to civilian organizations using the design and no charge will be made to cover the cost of development. The Admiralty set, a portable one, covers all the measuring tests prescribed in B.S. 1597, copies of which may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1, price 4s post free.

Izmir International Fair

The Council of the British Chamber of Commerce of Turkey has decided in principle to participate in the 1950 Izmir International Fair to the extent of again organizing a British Pavilion. Although final arrangements with the Fair authorities have still to be made, it is intended that the Chamber's section of the Fair shall consist of a complete wing of the main exhibition

building, the foyer and an open space round which the Chamber plans to erect covered stands, leaving the centre for the display of agricultural machinery, etc. This will be the 19th in the present series of Izmir Fairs and a record number of foreign participants is expected.

Midlands Electronics Exhibition

The Midlands Branch of the Institution of Electronics is holding its first annual Exhibition of Industrial Electronics in the Midlands at the Exhibition Floor, Lewis's, Ltd., Bull Street, Birmingham, 4, on 5th, 6th and 7th January, 1950. The leading manufacturers of electronic and television equipment will be displaying their latest products. Particular attention will be paid to such electronic equipment as is readily applicable to control problems characteristic of Midland industries. Free admission tickets for the preview can be obtained from Dr. W. Summer, chairman, Institution of Electronics (Midlands Branch), 31, Beech Road, Bournville, Birmingham, 30.

T.U.C. Economic Policy

After lengthy consideration and discussion with Ministers, the General Council of the Trades Union Congress has issued to its affiliated organizations recommendations on economic policy prepared by its Special Economic Committee. The gravity of the situation and the need for counteracting inflationary tendencies are stressed. The unions are urged to pay regard to realities and follow the General Council's recommendations. It is recognized that the problem of the standard of living of lower-paid workers may call for consideration in certain cases, but even in this direction the necessity for restraint should be considered. Special regard should be given to incentive schemes as a means of assisting these workers and, generally, each industry should study the possibility of extending payments by results systems.

Unions should consider the possibility of holding agreed wage rates under sliding-scale arrangements stable while the Interim Index of Retail Prices remains between 118 and 106. The General Council announces its intention to intensify its campaign for increased productivity and increased efficiency in industry.

Copper Development Association

The London office of the Copper Development Association, at Grand Buildings, Trafalgar Square, London, W.C.2, is being transferred to the Association's headquarters, and all communications should be addressed to the Association at Kendal's Hall, Radlett, Herts (telephone: Radlett 5616).

Window Display Competition

The annual showroom window display competition, organized by the North Western Electricity Board throughout an area stretching from Carlisle to Buxton, has been won this year by the Burnley showroom. The theme set was "The Board's Service to the Consumer," and over sixty showrooms competed. It was a condition that no more than £3 should be spent on any display.

Burnley thus hold the Challenge Cup, main award in the competition, for a year, and receive a replica. Replicas also go to the showrooms adjudged to have the best displays in each of the Board's seven Sub-Areas, and the winners were Salford, Leigh, Middleton, Preston, Carlisle and Hazel Grove. The layout of the Burnley Service Centre showed the service electricity can give to shop, factory, farm and home. The main judging panel comprised Colonel J. S. A. Walker and Miss N. Kenyon (members of the Board); Mr. A. O. Johnson (the

The prize-winning window display at the Burnley showroom

Board's chief commercial officer); Mr. J. M. Holmes (Principal, Manchester School of Art); Mr. A. R. Fasham (chairman, Manchester Branch of the Incorporated Advertising Managers' Association); and Mr. N. H. Bridge (the Board's commercial development officer).

Rawlplug Service Van

With the return to normal trading conditions the Rawlplug Co., Ltd., has put its first post-war technical service van on the road. The company's service vans were on permanent tour before the war, but during war time some vans found their way into work of national importance, and others on the Continent were lost sight of altogether. The new van is fully equipped to give practical demonstrations of the application of "Rawlplugs" and other products of the company. The seven window panels let into the sides and rear of the van carry display boards showing the complete range of Rawlplugs and tools and many of the other fixing devices and tools. The colour of the van is dove grey lined with blue and brightened by the chromium frames of the window panels. The background display boards are light blue to throw up the mounted tools, with headings in cream and black on dark blue.

The new service van for demonstrating Rawlplug devices

Building Centre Changes

To conform to present-day requirements the Building Centre, established in 1932 for the encouragement of a high standard of building and equipment, has been reconstituted. The original private company has been liquidated and a new company has been formed with more restrictive memorandum and articles so drawn up as to comply with the Board of Trade conditions for the exemption of the word "Limited" from the title. The Centre will continue to operate on a definitely non-commercial basis under a more widely representative Council of Management. Sir Giles Gilbert Scott is to be the first president, and Dame Caroline Haslett, director of the Electrical Association for Women, is to be one of the members of the Council.

Southern Electricity Board Trainees

For many years the large electrical engineering companies have been running graduate training schemes enabling suitably qualified students to get the practical training necessary for their future careers. Such a scheme is now being operated by the British Electricity Authority and there are already 15 graduate trainees with the Southern Electricity Board.

Essential features of the graduate training schemes are the students' associations, which, by organizing many activities outside normal working hours, help the students to get to know each other and develop and broaden their interests both in electrical engineering and other spheres.

With these objects in view, the students of the Southern Electricity Board have decided to form a Graduate Trainees' Association. An opportunity for the first meeting was the graduate and junior engineers' convention held recently at Southern Electricity House, Maidenhead. At this meeting Mr. G. A. Raymond was elected chairman of the association and Mr. H. W. Westbrook, secretary.

The object of the Association will be to bring together the students of the Board, for them to discuss their training and attend lectures. The Association's social activities will be limited owing to the great distances by which members are separated, but it is hoped to organize visits to places of interest.

Batti-Wallahs' Society

The use of electricity on board H.M. ships has advanced a long way since the days when the maintenance of the electrical installation and equipment was considered the job of the torpedo engineer. With the formation of the Electrical Branch the Navy is ensuring that it has fully qualified officers and ratings to operate the various specialized electrical services. An interesting account of the formation of this Branch and the stages which led up to its formation was given by Rear Admiral (L) S. L. Bateson at last week's luncheon of the Batti-Wallahs' Society. In a brief outline of the thorough training scheme for electrical officers he mentioned that, after leaving Dartmouth Col-

lege, three years were spent at Cambridge and two years in industry. Ratings underwent a nine months' course in electrical engineering before going to sea.

Hotpoint Appliance Manufacture

On 1st January next the Hotpoint Electric Appliance Co., Ltd., an associate of the British Thomson-Houston Co., Ltd., will assume responsibility for the direct manufacture of the electrical appliances that it markets, and on that date the name of the factory at Peterborough will be changed from B.T.H. to Hotpoint. Changes in personnel at the B.T.H. Rugby works following the appointment of Mr. C. W. Stoodley as general works manager of the Hotpoint Co., are announced in our "Personal and Social" pages to-day.

Trade Announcements

The headquarters of the Diesel Engine Division of the **English Electric Co., Ltd.,** have recently been transferred to Brownsover Hall, Rugby (telephone: Rugby 2278), where the administrative work and that of the sales, estimating, contracts and design departments is carried out. The general manager of the Division, Mr. A. V. Wilkin, has made the following appointments: Messrs. C. R. Parker (assistant general manager); L. I. Hadlow (chief estimating engineer); G. N. Petty (chief sales engineer); F. V. Morgan (chief contracts engineer); and J. A. Barker (chief, Dual Fuel Department).

Engineering Diamonds, Ltd., has recently introduced a scheme for resetting diamond tools for wheel dressing on a "contract" basis.

The Reliance Electrical Wire Co., Ltd., and Reliance (Cords & Cables), Ltd., inform us that the name of their parent company, the General Gas & Electricity Co., Ltd., has now been changed to **Reliance-Clifton Cables and Industrial Products, Ltd.**

The General Accessories Co., Ltd., announces the withdrawal, as from 1st November, of its quantity discount scheme applying to electrical contractors.

Electro Technical Industries, Ltd., informs us that, following reorganization of the business, the company is now in full production.

B.T.H. Sales Convention

At the invitation of Mr. E. H. Ball (managing director) and the directors of the British Thomson-Houston Co., Ltd., sales agents of B.T.H. 16 mm projectors were guests of the company for a sales convention at the Rugby works on 14th and 15th November. During the proceedings, Mr. D. S. Morfey, design engineer of the projector, gave a talk on projector design and future developments. Before the visitors went to the Coventry works to see the production of 16 mm and 35 mm projectors, they toured the research laboratory, the lamp factory and the heavy plant factory, at Rugby; particular interest was shown in the new heavy plant factory where some of the largest manufacturing plant in the Rugby works is installed for making the largest transformers, alternators for hydro-electric projects, generators and motors yet envisaged. The convention ended with a discussion on sales promotion.

Industrial Finishing

Donald Macpherson & Co., Ltd., makers of "Foochow" enamels, etc., have recently opened a new demonstration and development room at their Mitcham factory. Provided with the most modern equipment this new department will permit service and advice to be given on all finishing processes from the pretreatment of the metal to the finished product. New finishes are developed and tested, employing equipment similar to that used by the customer, a variety of different plants being available.

Scale Model Farm

Considerable interest was aroused at the English Guernsey Cattle Market Sale at Reading this week by a working model of an all-electric farm which Drake & Gorham, Ltd., were showing. Practically every electrical service available for farm use was covered—milking, sterilizing, milk cooling, water heating, pumping, hoisting, pneumatic conveying, grinding, root chopping, incubating, soil heating, soil sterilization, sawing, grinding, hedge cutting, lawn mowing, electric fencing, etc.; a crop-drying plant is to be added later. In the farmhouse, too, such labour-saving devices as radiators, refrigerators, cooker, water heaters, etc., were installed. Push-buttons made it possible to demonstrate four different combinations of lighting.

Battery-Operated Trucks

The shortage of man-power in industry has brought to the fore the value of mechanical handling of materials. The Chloride Electrical Storage Co., Ltd., has issued a well-produced brochure showing how the use of battery-powered electric trucks can help British industry in saving man-power and gives examples of the application of these trucks in factories and workshops.

Change of Name

Zodiac Electrical Products, of Leeds, has changed its name to Fluorescent Starters, Ltd., as from 1st December.

Next Week's Events

Monday, 5th December

BIRMINGHAM.—Town Hall, 6 p.m. I.E.E. South Midland Centre. Faraday Lecture on "Radar," by Dr. R. A. Smith.

LIVERPOOL.—Liverpool Royal Institution, Colquitt Street, 6.30 p.m. I.E.E. Mersey and North Wales Centre. Discussion on "The Commissioning of Generating Stations," to be opened by F. J. Hutchinson. (Joint meeting with the Liverpool Engineering Society).

LONDON.—At the Geological Society, Burlington House, W., 5.30 p.m. Society of Engineers. "Welding Research and Practice in the U.S.A.," by Dr. H. G. Taylor.

At the Institution of Electrical Engineers, Savoy Place, W.C.2, 7 p.m. Institute of X-Ray Technology. "X-Ray Crystallography," by F. Y. Poynton.

NEWCASTLE-ON-TYNE.—King's College, 6.15 p.m. I.E.E. North-Eastern Radio and Measurements Group. "Parasitic Forces existing in Induction Watthour Meters," by G. F. Shotter.

READING.—Great Western Hotel, 7 p.m. Institution of Electrical Engineers. District meeting. "The Development of Electro-horticulture," by C. A. Cameron Brown.

SHEFFIELD.—The University, 6 p.m. Illuminating Engineering Society, Sheffield Centre. "Fluorescent Lighting in Mines," by P. L. Ross.

Tuesday, 6th December

LIVERPOOL.—Merseyside & N. Wales Electricity Board's showroom, Whitechapel, 6 p.m. Illuminating Engineering Society, Liverpool Centre. "Theory into Practice," by G. W. Galley.

35, Grosvenor Place, S.W.1, 7 p.m. Women's Engineering Society. "Women and Electrical Engineering."

MANCHESTER.—Engineers' Club, Albert Square, 6.15 p.m., I.E.E. North-Western Centre. Lecture on "Some Electromagnetic Problems," by Professor G. W. O. Howe.

Wednesday, 7th December

BIRMINGHAM.—James Watt Memorial Institute, 7 p.m. Junior Institution of Engineers, Midland Section. "Transformer Automatic Voltage Regulators by On-load Tap Changing," by G. A. P. Jewiss.

LANCASTER. — N.W.E.B. Demonstration Theatre, North Road, 7 p.m. I.E.E. North Lancashire Sub-Centre. Lecture on "Some Electromagnetic Problems," by Professor G. W. O. Howe.

LONDON.—Savoy Place, London, W.C.2, 5.30 p.m. I.E.E. Radio Section. "Solar Radio-Frequency Radiation," by Dr. J. L. Pawsey, to be read by J. S. Hey.

MIDDLESBROUGH.—Cleveland Scientific & Technical Institute, 6.30 p.m. I.E.E. Tees-Side Sub-Centre. "Overhead Line Regulations," by H. W. Grimmitt.

NEWCASTLE-ON-TYNE.—Minor Durant Hall, 6.15 p.m. Illuminating Engineering Society, Newcastle Centre. "Fluorescent Lamp Installations," by W. A. R. Stoyle.

PALMERS GREEN.—St. John's Hall, Hoppers Road, 8.15 p.m. A.S.E.E. North London Branch. "Summation Metering," by H. Jackson.

PORTSMOUTH.—British Electricity House, 111, High Street, 6.30 p.m. I.E.E. Southern Centre. "Factors Influencing the Design of High-Voltage Air-Blast Circuit-Breakers," by C. H. Flurscheim and E. L. L'Estrange.

Thursday, 8th December

DUNDEE.—Royal Hotel, Union Street, 7 p.m. I.E.E. North-East Scotland Sub-Centre. "The Automatic Control of Lead-Acid Battery-Charging Equipment," by R. A. Harvey.

LONDON.—Savoy Place, London, W.C.2, 5.30 p.m. I.E.E. Utilization Section. "Technical Considerations Affecting the Development and Design of Electrical Control Gear for Machine Tools," by A. R. H. Thorne.

At the Lighting Service Bureau, 2, Savoy Hill, W.C.2, 6 p.m. The Engineers' Guild. Discussion on "Statutory Registration of Engineers."

MANCHESTER.—College of Technology, 6 p.m. Illuminating Engineering Society, Manchester Centre. "Lighting Aids to the Visual Art of Stage Production," by P. Corry.

Friday, 9th December

ABERDEEN.—Robert Gordon's Technical College, 7.30 p.m. I.E.E. North-East Scotland Sub-Centre. "The Automatic Control of Lead-Acid Battery Charging Equipment," by R. A. Harvey.

BIRMINGHAM.—Imperial Hotel, Temple Street, 6 p.m. Illuminating Engineering Society (Birmingham Centre). "Cold Cathode Lighting Equipment," by E. A. Langsdon.

BRISTOL.—Electricity House, Colston Avenue, 7 p.m. A.S.E.E. Bristol Branch. "Planning for Progress," by A. G. Ramsey.

LEEDS.—Association of Mining Electrical & Mechanical Engineers (Yorkshire North-West Branch). Paper by S. Francis.

LONDON.—Caxton Hall, S.W.1, 6.30 p.m. E.P.E.A. Southern Meter Engineers' Group. "Metal Rectifiers Applied to Measurement Purposes," by S. A. Stevens.

Storey's Gate, S.W.1, 5.30 p.m. Institution of Mechanical Engineers. Discussion on "Laminal Flow Aerofoil Theory and the Application of Analogous Methods to the Design of Kaplan Turbine Blades," by S. P. Hutton.

At the Royal Society of Arts, Adelphi, W.C.2, 7 p.m. Institution of Electronics. "Infra-Red Radiation," by B. N. Watts.

39, Victoria Street, S.W.1, 6.30 p.m. Junior Institution of Engineers. "Some Problems of Broadcasting," by H. Bishop.

NOTTINGHAM.—Victoria Station Hotel. Nottingham Society of Engineers. Annual dinner.

Spread Eagle Hotel, Goldsmith Street, 8 p.m. A.S.E.E. Nottingham Branch. "Switchgear & Motor Maintenance," by J. U. Smith.

STAFFORD.—King Edward Grammar School, 7 p.m. I.E.E. North Staffordshire Sub-Centre. Discussion on "Rectifiers," to be opened by J. E. Boul.

Saturday, 10th December

LONDON.—I.E.E. London Students' Section, 2.15 p.m. Visit to the British Oxygen Co., Ltd., Cricklewood.

Rural Distribution

High Voltage Phase/Neutral System Advocated

THE suitability of single-phase distribution for the more remote country districts was advanced by Messrs. G. T. Garwood and G. J. Websdale (South Western Electricity Board, Exeter and East Devon Sub-Area) in the paper they presented to the Supply Section of the Institution of Electrical Engineers last week.

The authors stressed the merits of the phase/neutral system, meaning a single-phase two-wire system derived from one phase and the neutral, respectively, of a three-phase four-wire high voltage system, the star point of which was permanently earthed otherwise than through an arc-suppression (Petersen) coil.

Considerable Savings

The use of this system in contrast to the normal practice in this country of utilizing two live phases was considered to be a means of effecting considerable economies in money and material without loss of safety or operating efficiency. The paper explained how the phase/neutral system simplified the design and reduced the cost of overhead lines, transformers, switchgear and (potentially) also affected protective arrangements.

Remarkable savings were claimed for cables, underground and suspended, in respect of diameter and cost, when using the lead or stainless steel sheath of single-core cables as the neutral; similar possibilities were promised by single-core aluminium cables working on the phase/neutral system, which the authors claimed to be probably 20 per cent more economical than the normal single-phase system employing two live phases. They considered it to be the only single means at present available whereby any substantial economy could be achieved.

Of greater economic merit in present circumstances would be the reduction in quantities of certain scarce materials (50 per cent fewer insulators and 80 per cent less steel work) so that adoption of the system would correspondingly increase the effective utility of existing supplies of these materials.

The fact that this system had hitherto been almost entirely neglected in this country, although widely used in the United States, had given rise to conditions and practices that might render its application now less easy that it might otherwise have been, but State ownership of the supply industry by admitting free interchange of transformers over wide areas had largely disposed of one of the principal difficulties.

The fact that existing main 11 kV lines in this country invariably operated as a three-wire system need not prevent the widespread use of the phase/neutral system for spurs. Between one-half and three-quarters of these lines were provided with continuous earthing wires and were capable of being converted to four-wire operation at small cost.

The authors concluded with recommendations that further experimental phase/neutral systems should be immediately proceeded with and that improved pole-mounted transformers and high-speed single-pole self-reclosing circuit breakers should be developed.

DISCUSSION

Mr. H. W. Grimmitt (Ministry of Fuel and Power) said that the 1947 Act unambiguously called for rural electrification, and the three-phase four-wire system with phases-to-neutral spurs seemed to meet the bill. Great care must be taken in making comparisons with America, where conditions were vastly different. There some of the spur lines were becoming very overloaded and the voltage had had to be put up. Here, on the contrary, the backbone of rural development, the mains, was in existence, and most of the work was spur lines. The idea of the common neutral had not been viewed with favour in the past. In the R.E.A. systems, where it was used, most of the apparatus was in earth-free stations with a very small amount of electrical apparatus

on the premises and there were therefore few accidents. Here it was quite a different proposition, and the saving involved would not be sufficient to justify the common neutral. He saw no means of effecting economy other than those proposed by the authors, apart from a reduction in labour costs and simplification in general lay-out.

Mr. P. K. Davis (B.E.A., Eastern Division) asked why the authors considered 15ft clearance desirable for h.v. neutral and only 14ft for l.v. neutral when installed on the same pole. He doubted, particularly in view of the new regulations which had been foreshadowed, whether 18ft clearances at road crossings would be acceptable (l.v. neutral). Stainless-steel-sheathed cable, being somewhat inflexible, could, he presumed, only be usefully used in suspended positions. He thought the authors' conclusions were in the main justified, but doubted whether their proposals would achieve 20 per cent saving. However, the chief virtue in these days of scarcity lay in the saving in steelwork and insulators and materials generally.

Post Office Interest

Mr. J. J. Edwards (G.P.O.) agreed that the Post Office would probably not be unduly perturbed by the extension of the four-wire high voltage multiple-earthed system and would watch developments with great interest. He asked how the rise of voltage on the high voltage line would be controlled so as not to rise above a fixed minimum. This had proved difficult of accomplishment. He drew attention to the need, should the experimental use of a multiple-earthed neutral not work out in practice, to be able to restore conditions to some extent. He emphasized the importance, with regard to the unearthed guard, of mechanical protection. On the stainless-steel-sheathed cable, he said the Post Office had tried out short sections as aerial cable during the past six years and it had proved almost fault-free. On clearances, he asked that the possibility of joint constructions with telephone circuits be borne in mind.

Mr. M. D. Stonehouse (British Electricity Authority) said it would be useless to reduce capital cost if, as a result, maintenance costs were increased or subsequent development cramped. The proposals of the authors seemed to meet all possible objections and, although he doubted whether 20 per cent saving would be achieved, there would undoubtedly be some saving on first cost. With regard to standardization, desirable though it was, he hoped there would still be the opportunity for experimental work, particularly where it seemed to offer a possibility of success.

Cable Tests

Mr. E. E. Hutchings (E.R.A.) thought there would be no objection to the authors' proposal for investigations by the E.R.A. on the ratings and characteristics of three-core lead covered cables under unbalanced conditions, provided this information was really required. It would be of interest in other connections, such as earth-fault currents. Most of it could be covered by a theoretical study, but a few check tests would be desirable. The calculations of the authors were, he thought, on the conservative side, as were their remarks on the limiting load conditions for unbalanced working. Again 175 deg C was a conservative figure for the operating temperature of the sheath in connection with short time thermal ratings of cables. The material on cross section of the continuous earth wire as a neutral conductor should be the same as that of the phase conductors. The suggestion that the out-of-balance current could be safely returned through the earth would not be accepted, he thought, in this country. With regard to the common l.v./h.v. neutral, it was considered economically impossible, in this country, in many areas, to reduce the over-all neutral resistance even to a value of 2 ohms.

Mr. J. R. Harding (Pirelli-General Cable Works) said the nomenclature—6.35 kV phase/neutral lines or 11 kV PL/N—should be settled. He saw no difficulty in using stainless steel cable underground and it was now available in longer lengths. A minor advantage of the single-core cable was that it enabled single sealing ends to be used. Care should be taken in converting normal three-wire 11 kV to four-wire by renaming. Many lines were old and the galvanized steel earth wires might be badly corroded. Single-phase lines, he agreed, should be freely used where adequate for the foreseeable load. It would be reasonable to convert one of the spurs

to three-wire by the addition of other conductors where required. He doubted the overall saving figure, though on the single-phase spur line it might be near the mark.

Mr. K. L. May (Southern Electricity Board) pointed out that 2ft 6in spacing was apt to cause conductor clashing. On ground clearances, he asked whether the authors were right in saying the Ministry's practice had been to stipulate minima for live conductors only. The development of unearthed lines tended to reduce the advantages of the auto-reclose circuit-breaker due to the elimination of about 70 to 80 per cent of transient faults. Its value also fell with the Petersen coils. He thought it wrong to suggest that vertical spacing did not involve extra cost. The lifting of the conductors was bound to add to the cost of the pole. The case for the authors' system seemed to him to stand or fall on economics. He was pessimistic about the figure of 20 per cent and thought a check should be made by comparing the cost on the phase/neutral basis of an existing block of a rural network with an estimate based on the work of the authors. While the aim might be to save money, there might be a loss of two-thirds capacity of the network.

Mr. Websdale, replying, said the authors were convinced that they could show a saving of 20 per cent on a reasonable rural network; but the saving of material was even more important. While the cost would be increased by running a fourth conductor on an existing three-wire line, the whole cost would not fall on the first spur. He was inclined to agree that the common neutral was not suitable to this country. As regards 15ft for h.v. (neutral) and 14ft for l.v. on the same pole, this would be given further consideration. The stainless steel cable could be buried, but in general the phase/neutral lines would be overhead. Voltage rise would be controlled by effectively earthing the neutral and keeping earth resistance as low as possible. Co-operation with the Post Office would be essential, as also on ground clearances. Earth wires, if corroded, would not be doing their job in any case and their replacement need not be debited to the phase/neutral system. Conductor clashing should be avoided to some extent by the lateral displacement between the phase wire at the top of the pole and the neutral wire on the bobbin below. The authors understood that the regulations or ground clearances referred to live conductors and thought the matter would be cleared up in the new regulations. They did not propose longer poles for the phase/neutral system and the same poles would be used as for the B.S. 1320 single-phase line.

Festival of Britain

Arrangements for Industrial Exhibits

WITHIN the limited space available on the site on the South Bank of the Thames, the organizers of the Festival of Britain, 1951, aim at presenting the most important aspects of British science, technology and industrial design. The exhibition will not be a trade fair; it will only form an introduction to any particular industry.

The selection of all currently manufactured exhibits will be in the hands of the Council of Industrial Design which has been holding regular discussions with groups of manufacturers and trade associations to ensure the proper presentation of British industry's leading achievements. The goods exhibited will be shown as far as possible in the settings in which they are principally applied.

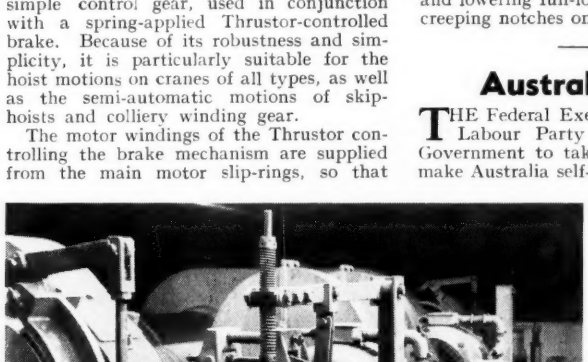
Designers in each section will be able to refer to a "1951 Stock List," an illustrated index of the best current industrial design, compiled with the aid of manufacturers, and will be guided by small industrial panels. Manufacturers are asked to submit to the Council of Industrial Design (Tilbury House, Petty France, S.W.1) photographs measuring about 8in by 6in of those of their products which show the latest design developments. Among the classes included in the Stock List will be stationary power plant; electrical equipment ranging from power station plant, switchgear and transformers to accumulators and signs; and electronic equipment—broadcasting transmitters, telecommunications equipment and remote control systems.

A list of industrial exhibits issued by the Festival organizers includes catering equipment, domestic appliances, electrical power production and utilization, and electric lighting.

Hoist Control

A FORM of electric hoist control for obtaining stable creeping speeds with a.c. motor drives has been developed by the British Thomson-Houston Co., Ltd. Known as "Stacreep" control, it comprises a standard-wound rotor induction motor, with simple control gear, used in conjunction with a spring-applied Thrustor-controlled brake. Because of its robustness and simplicity, it is particularly suitable for the hoist motions on cranes of all types, as well as the semi-automatic motions of skip-hoists and colliery winding gear.

The motor windings of the Thrustor controlling the brake mechanism are supplied from the main motor slip-rings, so that



"Stacreep" control applied to an overhead crane. In the foreground is the Thrustor for controlling the brake mechanism of the crane

when the main motor is switched on, full volts at line frequency are applied to the Thrustor through a transformer, thus releasing the brake. As the main motor accelerates, the volts and frequency supplied to the Thrustor fall and the brake is applied until a balance point is reached where the sum of the load and braking torque is equal to the motor torque, giving a completely stable slow speed at any load.

The control circuit is normally arranged so that it is effective on the first two notches of the controller in either the "hoist" or "lower" direction On the third and following notches a contactor disconnects the Thrustor from the rotor slip-rings and connects it to the main supply to give a normal Thrustor-controlled brake.

With known details of the hoist mechanism and brake it is possible to choose the rotor resistance values on the various creeping notches to give any reasonable creep speed.

While the creep speed varies slightly with the load, it has been found possible to obtain substantially the same creeping speed at full-load hoist, hoist or lower light-hook, and lowering full-load, by making use of all creeping notches on the controller.

Australian News

THE Federal Executive of the Australian Labour Party is asking the Federal Government to take all necessary steps to make Australia self-supporting in the manufacture of all machinery for generating electric power.

The steady increase in Australian electricity consumption over the past ten years is shown in official figures just released. In 1938-39 it totalled 2,718 million kWh; in 1945-46 it had increased to 3,939 million; by the following year it was up to 4,195 million; in 1947-48 4,709 million; and in 1948-49 the consumption was 5,042 million kWh. Consumption during the first months of the current year (1949-50) has shown a further steady increase.

It is proposed to electrify the Melbourne-Geelong railway at a cost of £1,188,000. The number of passenger trains each way daily will be increased to eighteen compared with seven at the present time and eleven before the war.

Engineering Exhibition

THE second London Regional Display, an exhibition organized by the Engineering Industries Association for member firms in the London area, was held on 23rd November at the Royal Horticultural Society's New Hall, London, S.W.1. The display was not a large one, but of the 100 or more firms exhibiting, about one-third were showing electrical products. The exhibition was open only to those in the engineering trades, and it was well attended.

Electricity Supply

Economy Cuts Criticized : Deptford Sulphur Complaint

AT a meeting of the Somerset Executive Committee of the National Farmers' Union, at Taunton, it was stated that a resolution had been tabled by Mr. J. T. Beresford and Mr. Scobell for discussion at the meeting of the South Western Electricity Consultative Council at Torquay in December regarding the Chancellor's speech on 26th October in the House of Commons. The resolution views with concern the proposed cuts in electricity development and asks the S.W. Electricity Board to ensure that its plans for the extension of electricity to agriculture and dependent crafts, industries and personnel in the countryside are retained and carried out on the existing basis of priority.

Fixed Charges

Reference was made at a meeting of the Suffolk Local Committee of the Eastern Electricity Consultative Council at Ipswich on 21st November, to a complaint by the Santon Downham Tenants' Association that, whereas the electricity fixed charge for a Council house was 12s a quarter, the houses which had been erected by the Forestry Commission were assessed at £1 2s 6d a quarter. After considering the Board's reply to a request for a further definition of "Council house," the Committee decided that, although it appreciated that the present charges were made in accordance with the existing tariff, the Board should be pressed to provide information about the new tariffs being considered by national committees as soon as they had made their recommendations.

Abolition of Discount

The Essex Local Committee of the Eastern Electricity Consultative Council on 17th November considered a protest against the abolition of the 5 per cent prompt payment discount which had been applicable to Southend-on-Sea and district. On behalf of Southend residents it was suggested that the abolition would increase costs of collection. The chairman said that the matter had been taken up with the Board. He had been informed that the withdrawal of the discount had resulted in a revenue increase of approximately £17,000 and it had not been necessary to employ any additional staff by reason of the abolition. The Committee felt that any reintroduction of discounts could only be on an area or national basis, and decided that it could not recommend supporting the application for the reintroduction of the discount in Southend.

Chester Lighting Experiment

In order to provide an example of fluorescent lighting in Chester, the Merseyside and North Wales Electricity Board has offered to carry out for a period of one month a trial installation in either Eastgate Street or Bridge Street. If the Town Improvement Committee is not in favour of the scheme after the trial, the Board will remove the columns and only charge the Corporation the cost of removal. The offer of the Board is to be accepted, and the lamps are to be installed in Bridge Street.

Power for Atom Plant

It was stated in Liverpool last week that a new power station similar to that under construction at Bromborough, Cheshire, is to be erected at Capenhurst, Wirral, to supply power for the atomic-energy development plant to be installed at Capenhurst next year. The new station will have top priority and is expected to be completed and operating by 1953. Planning and constructional work will be carried out by the engineers of the Merseyside and North Wales Division of B.E.A.

Deptford Sulphur Emissions

Greenwich Health Committee reports that a further complaint was received that sulphur had been emitted recently from the chimneys of the Deptford power station, causing a serious nuisance to the residents in the locality. The B.E.A. was written to and the generation engineer stated that all the short-term measures promised last year, had been completed and other measures to reduce smoke emission had also been put in hand. The Deptford West station was now discharging all chimney gases through the tall chimneys, and part of the Deptford East chimney gases were being discharged through the new chimney erected last year. It was therefore presumed that the recent sulphur emissions were caused by the short chimneys at the Deptford East station. The reconstruction work now in hand would eventually ensure that gases were dis-

charged only from tall chimneys (300ft high or more). It was planned that this work should be completed in about five years' time, but due to national causes there had already been some delay in this programme. The reconstruction at Deptford East was also allied to reconstruction work on the British Railways Southern Region electrical system and these programmes of work must necessarily keep in step. It was, however, anticipated that there would be some reduction in the amount of gases discharged from the low chimneys in about three years' time and after that date reduction should continue progressively.

New Yarmouth Station

Sq./Ldr. E. Kinghorn, M.P. for Great Yarmouth, has been informed by Lord Citrine, chairman of the B.E.A., that it is unlikely that work will start on the proposed new generating station at Great Yarmouth before the middle of 1951. The decision was reached because the rate of expansion of the manufacturers' productive capacity had not been sufficient to keep pace with the Authority's increasing requirements, the supply of skilled labour had not been sufficient in all branches of the industry, and it had been necessary to restrict new capital investments. In the meantime, the site required for the new station had been agreed, and approval in principle to the location of the station on that site had been obtained from the regional planning authorities. Detailed planning of the layout of the station was proceeding.

Street Lighting Conversion

Hinckley Urban District Council is to convert street lighting in John Nichol's Street and King George's Way from gas to electricity.

Brigg Council proposes the conversion of all the town's street lighting from gas to electricity.

Midlands Consultative Council

The eighth meeting of the Midlands Electricity Consultative Council was held in Birmingham on 18th November, when tributes were paid to Mr. A. Cook, J.P., a member of the Council who died recently. The Rev. R. A. Giles, M.A., B.Litt., received the congratulations of the Council on his appointment by the Minister of Fuel and Power to be deputy chairman, and a welcome was extended to five new members.

Considerable discussion took place on the decision of the Midlands Electricity Board to discontinue the hire of electrical apparatus and replace this with a credit sales scheme. Having heard the explanation given by Mr. H. J. Gibson, the Board's chief commercial officer, particularly the approximation of what would be the present-day quarterly hire charge to the amount payable for the same period under the credit sales scheme, the Council decided not to take any further action in the matter.

In connection with rural electrification, the Council unanimously adopted a resolution recording its conviction that agriculture should maintain its priority position in view of the contribution it could make to the solution of the nation's difficulties, and urging the Board not to discontinue or defer schemes for the electrification of productive agricultural units or areas. Mr. Gibson said that plans were being considered by the Board for the electrification of rural areas in large groups as collective units, instead of "piecemeal." Last year the Board had connected about 1,200 farms and the same number of rural cottages.

Exemption from Lighting Restriction

The Minister of Fuel and Power has granted a licence—the Electric Lighting (Isolated Areas) (Scotland) Licence, 1949—exempting specified areas in the North of Scotland District which are not connected with the grid from the Electric Lighting (Restriction) Order, 1949. The latter Order prohibits the use for business advertisement of lighting fittings consuming energy supplied by an Electricity Board, and restricts the standard of lighting in shops, hotels, etc. The exempted areas include Arrochar (Dunbarton), the counties of Bute, Caithness, Orkney and Zetland, parts of Argyll, Inverness and Ross and Cromarty and the islands of Skye, South Uist and Lewis. The licence (S.I. 1949 No. 2158) came into force on 28th November.

Appliance Hire Purchase

The sixth meeting of the South West Scotland Electricity Consultative Council was held in Glasgow on 17th November, when the chairman, Councillor A. B. Mackay, presided. It was reported that the Area Board had decided to reintroduce a scheme of hire purchase for electrical appliances. The Council expressed appreciation of the action of the Board in thus making available such items as cookers, water heaters, refrigerators, wash boilers, vacuum-cleaners and agricultural appliances.

Swiss Power Imports

Because of the effects of the long drought last summer on Switzerland's water resources for hydro-electric production electricity is to be imported from the Netherlands via the German high voltage network.—*Reuter.*

FINANCIAL SECTION

Company News — Stock Exchange Activities

Reports and Dividends

Crompton Parkinson, Ltd., report a net profit for the nine months ended 30th June last (including the profits of subsidiary companies for periods varying from nine to fifteen months) of £499,799, as compared with £522,065 for the preceding year. It is proposed to pay a final dividend on the ordinary and "A" ordinary stock of 7½ per cent actual, making a total of 15 per cent actual and a special cash bonus of 7½ per cent on the ordinary and "A" ordinary stock. It is also proposed that £5,000 be paid to the trustees of the Central Benevolent Fund. After bringing in £105,150, being provisions no longer required and profits relating to previous periods, there is a balance of £1,877,459 to be carried forward (subject to the capitalization referred to below), as compared with £1,656,506 at 30th September, 1948.

The directors recommend an increase in the authorized capital by the creation of a further 5,400,000 "A" ordinary shares of 5s each and a free issue of "A" ordinary stock to holders of ordinary and "A" ordinary stock in the ratio of one new unit for each unit of ordinary or "A" ordinary stock held. The sanction of the Treasury has been obtained and the issue is recommended to be made on 31st December next. For the purpose of the issue it is proposed to capitalize and appropriate £769,449 standing to the credit of capital reserve, £552,628 of general reserve, and £216,821 being part of the unappropriated profits, £1,538,898 altogether. The sum of £1,660,638 will then remain to be carried forward as profits unappropriated. Meetings of members will be held on 16th December.

In his speech, which has been circulated with the report and accounts, Mr. A. Parkinson (chairman) says that the continuing inflationary effect of the national economy has been reflected in higher costs, which they have been able to offset in part by improvements in manufacturing and administrative technique. Some selling prices have been increased and some reduced. Despite fluctuations in both volume and selling prices, the demand for their products as a whole has remained at a high level throughout the period under review.

Dealing with the consolidated balance sheet, the chairman says that a year ago he foresaw a reduction in their investment in stock-in-trade and work in progress based on a more readily availability of raw materials and parts. Raw materials and parts have been more readily available, but the resultant reduction in the volume of stock has been largely countered by a continuance of the rise in costs. Moreover, the growing complexity of import controls (even embargoes) and currency controls in overseas territories now necessitates the retention of a greater volume of finished goods for longer periods and has thereby increased their investment.

Any consideration of the overseas position is strongly influenced by the devaluation of the £ sterling, and the revaluation of other national currencies. The effect of devaluation was an almost immediate increase in the price of certain Government-controlled non-ferrous metals. For this reason their costs were increased and it became necessary to raise some of their selling prices. In spite of this, devaluation has increased their ability to compete in some overseas markets against the local manufacturer, and in many overseas markets against some foreign competitors. Except in regard to Canada, their dollar-earning capacity is not great, but they are looking forward to an early expansion of business in Canada and in South American countries in due course. In other countries, Government protection of local manufacture, to some extent, will prevent exploitation of their advantage, but, in general, he expects to see an increase of business. Referring to the proposed bonus issue, Mr. Parkinson says that this issue of free shares does not imply any change in the board's profits distribution policy.

The British Electric Transformer Co., Ltd., reports a profit for the nine months ended 30th June last of £70,480, as compared with £86,318 for the preceding year. It is proposed to pay a dividend of 3¾ per cent on the preference shares for the nine months and a dividend of 2s 7d per share on the ordinary shares. After setting aside £11,585 to reserve for future income tax arising from change of year end, there is a balance of £1,040 to be carried forward (£961 at 30th September, 1948). In addition, the directors have decided to declare an interim dividend of 1¼ per cent on the preference shares for the three months to 30th September last.

Burco, Ltd., reports a trading profit for the year ended 30th September last of £98,356, as compared with £103,344 for the previous year and after deducting depreciation, taxation, etc., there is a net profit of

£36,535 (against £42,890). General reserve receives £16,000, and the dividend for the year is maintained at 35 per cent. The balance carried forward is £20,650 (against £20,327 brought in).

Heenan & Froude, Ltd., report a group trading profit of £311,115 for the year ended 31st August last, as compared with £219,132 for the preceding year, and after adding interest and deducting depreciation, taxation, etc., there is a net profit of £102,102 (against £60,147), as already announced, the final ordinary dividend is 10 per cent., again making 15 per cent for the year. The balance carried forward in the parent company's accounts is £47,434 (against £25,712), and in subsidiaries' accounts £17,178 (against £35,784 brought in).

Electric & Musical Industries, Ltd., reports a trading profit, together with subsidiaries in England and British overseas territories, for the year ended 30th June last of £1,040,418, as compared with £1,232,752 for the previous year. After deducting depreciation, taxation, etc., the net balance is £346,720 (against £498,192). The ordinary distribution for the year is again 8 per cent (including a bonus of 2 per cent), and the balance carried forward is £463,241 (against £449,045 brought in).

The General Electric Co., Ltd., has called a meeting for 21st December for the purpose of considering resolutions increasing the directors' borrowing powers up to twice the issued capital (now £9,798,000). Their present limit is the amount of authorized capital (£11,600,000). The total of borrowing is now £8,000,000.

Aberdare Cables of South Africa, Ltd., reports a net profit for the year ended 30th June last of £29,609, as compared with £11,997 for the preceding year. The ordinary dividend for the year is 6 per cent, less tax (against 2½ per cent).

Belliss & Morcom, Ltd., have declared an interim dividend of 4 per cent (unchanged).

New Companies

Telefusion (Chesterfield), Ltd.—Registered 22nd November. Capital £500. To construct and maintain wireless signal stations, etc. Directors: J. C. Wilkinson and Constance M. Wilkinson. Regd. office: 11, Nicholas Street, Burnley.

Chilton Electric Products, Ltd.—Registered 22nd November. Capital £8,500. Directors: A. R. Ward, P. F. D. Bush, C. A. F. Shapcott and J. R. Freeman. Regd. office: Hungerford, Berks.

Fluorescent Starters, Ltd.—Registered 18th November. Capital £2,000. Manufacturers and repairers of, agents for and dealers in artificial lighting apparatus, electrical plant, etc. Directors: E. Bastow, G. Daniels, Winifred A. Bastow and Helen Daniels. Regd. office: 33, Springfield Road, Guiseley, Yorks.

Stuart & Dorfman (Electrical), Ltd.—Registered 11th November. Capital £1,000. To acquire the business of electrical and radio engineers now carried on at 168, West Derby Road, Liverpool, as "Radiolek." Directors: D. S. Hogg and B. Dorfman. Regd. office: 168, West Derby Road, Liverpool, 6.

Liquidations

Electrical Power Installations (South Wales), Ltd.—Winding up voluntarily. Liquidator, Mr. S. Cater, 35, Windsor Place, Cardiff. Particulars of claims to the liquidator by 31st December.

Bankruptcies

Electrical Installations, High Street, Sunningdale, Berks, electricians.—Receiving order made 16th November on a creditor's petition.

F. M. Burrows, residing at 33a, Cowesby Street, Moss Side, Manchester, formerly carrying on business at 269, Kingsway, Levenshulme, Manchester, as an electrical engineer.—Public examination 20th January at the Court House, Quay Street, Manchester.

J. T. Southwood, 13, Brandreath Road, Compton, Plymouth, lately carrying on business at Belgrave Garage, Mutley, Plymouth, electrical engineer.—Application for discharge to be heard on 22nd December at 4, Elliott Street, The Hoe, Plymouth.

E. Cheetham, electrician, formerly carrying on business at 377, Ashton Old Road, Manchester, as an electrical contractor. Receiving Order made on 21st November on debtor's own petition.

N. I. Wagstaff, electrician, formerly carrying on business with another as Wagstaff & Williams, electrical contractors, at 145, Lodge Lane, Dukinfield, Ches.—Receiving Order made 23rd November on debtor's own petition.

L. Atelson, trading as Leonards, 336, Station Road, Harrow, Middx., radio and electrical fittings.—Public examination 10th January at Bankruptcy Buildings, Carey Street, London, W.C.2.

R. T. H. Brimfield, lately carrying on business under the style of Richfield Electrical Components, at 73-78, High Holborn, London, W.C.1, electrical contractor.—Last day for receiving proofs for dividend 12th December. Trustee, Mr. F. H. Langmaid, Bankruptcy Buildings, Carey Street, London, W.C.2, Official Receiver.

FINANCIAL SECTION
STOCKS and SHARES

THE entry of December usually starts Stock Exchange talk about the influence of Christmas, as this is likely to affect the volume of business in the markets generally. This year, the political outlook being so undecided as it is, opinion in the House seems to suggest that activity can scarcely be expected. Nevertheless, there is a fair amount of trade going on in the gilt-edged market, where the tone is firm, and, elsewhere, dealings have been reasonably active in Cable & Wireless, with wide fluctuations. After dipping to 224, the ordinary stock rose to 230, leaving a loss of 6¼ as compared with a month ago. Other fluctuations on the month set out overleaf show a majority of falls, though in most cases of no great consequence.

Cable & Wireless

As just observed, the immediate response to the assumed (and probable) rejection, a week ago, of the Cable & Wireless Company's reconstruction plan, was a jump in the price of the ordinary. Opponents of the scheme have had, of course, no more than a negative success: proposals for an outright liquidation would, it is believed, be equally unsuccessful in securing the majority necessary for adoption. Expectations now look for some sort of compromise which will result in a more liberal distribution of the assets, and a corresponding reduction in the scope of the residual investment trust.

Considerations of Yield

About a dozen companies connected with the electrical industry have recently made bonus issues of shares. A list of these was set out in our issue of 11th November, when, in the same table, probable dividends were given, based on the adjustment of the previous distributions to the new conditions under the bonus issues. By way of example, General Cables made a bonus issue of three new shares for two old, and the dividend of 50 per cent to be adjusted to the new capital would be 30 per cent. In some cases, Murex for example, companies gave share for share; the Murex dividend was 20 per cent and, under the new arrangement, would be automatically reduced to 10 per cent. In our table overleaf, these adjustments are made, and the yields calculated on the assumption that the previously paid dividends will be maintained at a corresponding rate allowing for the new shares. Therefore, the yield on Telegraph Constructions, for example, in the table is entered as £5 4s per cent, calculated, that is, upon the 8 per cent which is equivalent to the previously paid 10 per cent before the bonus issue.

Crompton Parkinson's Bonus

Crompton Parkinson 5s ordinary responded well to the proposed distribution of a 100 per cent share bonus from the company's ample reserves. At 23s 9d the price is 1/6 to the good, and now provides a yield of £4 14s 6d per cent on the usual 22½ per cent payment, of which 7½ per cent is declared as bonus. In distributing the share-for-share bonus, the company will be capitalizing just about half the last balance sheet total of capital and revenue reserves, exceeding £3 million in all. Accompanying this announcement is the final dividend declaration—the same as before—and a preliminary profits statement for the nine months to last June, which month now terminates the financial year. The net profit of £500,000 relates to varying periods for the subsidiaries, and is consequently not comparable with the previous full year's figure of £522,000.

E.M.I. Accounts

Full accounts now published by Electric & Musical Industries show net profits for the group (including the subsidiaries in British overseas territories) at £346,700, against the previous year's figure of just under half a million. Charges on this occasion include the interest on the £2 million 4 per cent notes issue, which appears for the first time in the balance sheet, eliminating most of the bank overdrafts in last year's accounts. After deducting preference dividends paid during the year, the surplus of trading profits represents earnings of about 20 per cent on the ordinary capital, on which the dividend is 6 per cent, plus 2 per cent bonus. At 15s. 3d the 10s shares yield just over 5¼ per cent.

South African Cable Company

A dividend of 6 per cent, against 2½ per cent last year, from the Aberdare Cables of South Africa Company indicates that this comparatively new business is getting into its stride. At the last meeting, in March, Sir George Usher reported that deliveries against orders approaching half a million pounds were being effected in increasing volume. Net profits for the year ended last June are stated provisionally to have more than doubled, to £29,600. The yield of 2¼ per cent on the 5s. shares at 14s 6d is an earnest of the results expected from full production at the new factories.

Electrical Investments

Past Month's Price Changes

Company	Dividend Previous	Dividend Last	Middle Price 28 Nov. 1949	Month's Rise or Fall	Yield £ s. d.
Overseas Electricity Companies					
Atlas Elec.... ...	2	2½	13/-	+3 1.	3 17 0
Calcutta Elec. ...	6†	6†	24/-	—6d.	4 18 0
Cawnpore Elec. ...	13	10	40/-	—	5 0 0
East African Power	7	7	33/3	—	4 4 2
Jerusalem Elec. ...	5	6	17/-	—	—
Madras Elec. ...	8	5	33/9	+3/9	2 19 2
Nigerian Elec. ...	12½	10	35/-	—	—
Palestine Elec. "A"	7†	Nil	28/6	—	—
Perak Hydro-Elec.	Nil	Nil	11/-	—	—
Whitehall Inv. Pref.	—	6	22/-	xa	5 9 1
Equipment and Manufacturing					
Aberdare Cables ...	10	15	52/6	—2/6	5 14 3
Aron Elec. Ord. ...	15	15	37/6	—	8 0 0
Assoc. Elec. Ord. ...	15	15	70/-	—1/6	4 5 9
Automatic Tel & El.	12½	12½	51/9	+6d.	4 17 0
Babcock & Wilcox	15	15	60/-	—	5 0 0
Baldwin, H. J. (2/-)	25	25	5/3	—6d.	9 10 6
British Aluminium	10	10	41/6	+1/6	4 16 5
B.I. Callender's ...	6⅔	6⅔	31/-	—	4 6 0
British Thermostat (5/-)	23½	25	23/9	—	5 5 3
British Vac. Cleaner (5/-)	20	20	8/-	—6d.	12 10 0
Brush Ord. (5/-) ...	—	10	5/9	—	8 13 10
Burco (5/-) ...	35	35	18/9	—9d.	9 6 8
Chloride El. Storage	20	20	90/-	—	4 9 0
Cole, E. K. (5/-) ...	22½	20	12/-	+9d.	8 6 8
Cossor, A. C. (5/-)...	Nil	Nil	6/-	—6d.	—
Crabtree (10/-) ...	17½	17½	32/6	—1/-	5 7 8
Crompton Parkinson Ord. (5/-) ...	22½	22½	23/9	+⅛	4 14 6
De La Rue (5/-) ...	50	50	21/3	—	11 15 4
Decca (1/-) ...	112½	112½	12/6	—6d.	9 0 0
E.M.I. (10/-) ...	6	8	15/3	+6d.	5 5 10
Electrical Components (5/-) ...	20	20	10/-	—9d.	10 0 0
Elec. Construction	12½	12½	46/6	—1/9	5 7 9
Enfield Cable Ord.	7½	7½	27/6	+6d.	5 9 1
English Electric ...	10	10	42/6	—2/6	4 14 1
Ericsson Tel.(5/-) ...	20†	20†	37/6	—2/-	2 13 4
Ever Ready (5/-) ...	40	40	27/-	—	7 8 2
Falk Stadelmann ...	15	15	36/3	—⅛	8 5 6
G.E.C. Ord. ...	17½	17½	72/6	—1/-	4 10 7
General Cables (5/-)	50	50	18/9	—	7 14 8‡
Greenwood & Batley	15	15	40/-	—⅛	7 10 0
Hackbridge Cable (5/-)	—	20	11/9	—6d.	8 10 2
Hackbridge Hewittic (5/-)	12	12½	11/-	—	5 13 8
Hall Tel. Acc. (10/-)	10	10	13/-	—	7 13 10
Heatrae (2/-) ...	12½	12½	4/-	—	6 5 0
Henleys (5/-) ...	20	20	21/6	—1/-	4 14 1
Hoover (5/-) ...	40	40	35/-	+¼	5 14 3
Intl. Combustion (5/-)	37½	37½	17/6	—	4 6 0‡
Johnson & Phillips	15	15	58/9	—9d.	5 2 0
Equipment and Manufacturing (continued)					
Lancashire Dynamo	22½	22½	91/3	—	4 18 9
Laurence, Scott(5/-)	12½	12½	12/3	—3d.	5 3 1
London Elec. Wire	10	10	45/-	—	4 9 0
J. Lucas	17½	17½	78/9	—	4 8 10
Mather & Platt ...	11	11	46/9	—3d.	4 14 0
Metal Industries ...	10	10	42/-	+9d.	4 5 3
Mid. Elec. Mfg. ...	35	35	53/9	+9d.	—
Murex	20	20	45/-	—	4 9 0‡
Newman Ind. (2/-)	22½	17½	3/6	—	—
Oldham & Son (1/-)	60	60	5/-	—	6 0 0‡
Plessey (5/-) ...	20	20	13/9	—	7 5 5
Parsons C. A. ...	12½	12½	57/6	—½	4 7 0
Pye Deferred (5/-)	25	25	26/3	—1/16	4 15 3
Radio & Tel. (2/-)	Nil	25	1/6	—6d.	—
Revo (10/-) ...	27½	27½	45/-	—⅛	6 2 3
Reyrolle	12½	12½	57/6	—2/-	4 6 10
Scophony Baird (1/-)	—	—	3/-	—	—
Scot. Cable (4/-) ...	30	30	22/-	—	5 9 0
Siemens Ord. ...	7½	7½	30/-	—	5 0 0
Switchgear & Cowans (5/-)	20	20	13/-	—	7 14 0
T.C.C. (10/-) ...	15	15	32/6	—	4 12 4
T.C. & M. ...	10	10	37/6	—1d.	4 5 4‡
Telephone Mfg. (5/-)	9	9	8/6	—	5 6 0
Thorn Elec. (5/-) ...	25	20	15/-	—	6 13 4
Tube Investments	25	25	51⅛	+⅜	4 8 0
Vactric (5/-) ...	Nil	Nil	8/9	—3/3	—
Veritys (5/-) ...	5	5	2/9	—	9 1 10
Walsall Conduits (4/-)	70	70	53/9	—	5 4 1
Ward & Goldstone (5/-)	50	50	48/6	—	5 3 1
Watford (2/-) ...	15	20	6 3	—3d.	6 8 0
Westinghouse Brake	14	14	62/6	—9d.	4 9 7
West, Allen (5/-) ...	10	10	7/-xb	—	4 9 3‡
Transport and Communications					
Anglo-Am. Tel: Pref.	6	5⅝	95	—7½	—
Def.	1½	1½*	12½	—	—
Anglo-Portuguese...	8	8	24/6	—1/-	6 10 8
Brit. Elec. Traction: Def. Ord. ...	50	50	1425	—100	3 10 3
Calcutta Trams ...	Nil	6†	26/-	—½	4 12 4
Cape Elec. Trams...	6	6	25/-	—1/-	4 16 0
Cable & Wireless: 5½ Pref. ...	5½	5½	99	—8	5 11 0
Ord.	4	4	250	—6½	—
Globe Tel. & Tel. Ord	5†	5†	38/9	—5/-	2 11 6
Great Northern Tel. (£10)	12	7	14	+1½	5 0 0
Inter. Tel. & Tel....	Nil	Nil	18½	—½	—
Marconi Marine ...	7½	7½	25/-	—	6 0 0
Oriental Tel. Ord....	10	16	44/6	—3/-	7 3 10
Telephone Props ...	6	6	15/-	+⅛	8 0 0
Tele. Rentals (5/-)	10	10	9/6	—	5 5 3

*Dividend postponed.

†Dividends are paid free of Income Tax.

‡ Yield adjusted to capital bonus issue.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1944

19376. General Electric Co., Ltd., Harrison, W., and Hickling, F. J.—Charging devices for moulding presses. 9th October, 1944. (631934.)

19377. General Electric Co., Ltd., and Hickling, F. J.—Apparatus for feeding material in pellet form. 9th October, 1944. (631935.)

1945

4767. General Electric Co., Ltd., and Bowd, A. G.—Loop-forming devices for cables. 26th February, 1945. (631864.)

10038. Ferranti, Ltd., and Humber, F. L.—Apparatus for drying hollow wet-moulded products. 27th April, 1945. (631656.)

12700. Ferranti, Ltd., and Humber, F. L.—Manufacture of hollow moulded articles such as pottery or china. 21st May, 1945. (631657.)

16651. Union d'Electricité.—Apparatus adapted to measure or compare sinusoidal functions, with particular reference to the actuation of protection devices for electrical distribution networks. 14th April, 1942. (631725.)

16652. Union d'Electricité.—Selective protection of sections of an electric transmission line. 10th September, 1943. (631726.)

19455. General Electric Co., Ltd., and Jesty, L. C.—Electrical image reproducing apparatus for use in photography. 30th July, 1945. (631937.)

24242. General Electric Co., Ltd., Peters, W. H., and Garthwaite, F. N.—Tuning indicators for radio receivers and the like. 19th September, 1945. (631938.)

1946

318. Munthesen, N.—Snap-action electric switch with one push-button. 2nd October, 1943. (631939.)

700. Union d'Electricité and Compagnie pour la Fabrication des Compteurs et Matériel d'Usines à Gaz.—Regulating means for electrical power systems. 7th December, 1944. (Cognate application 701/46.) (631866.)

11297. Philco Products, Inc.—Counting, or frequency divider circuits. 12th April, 1945. (631869.)

12298. Union d'Electricité.—Devices for measuring or comparing periodic functions. 20th November, 1945. (631728.)

12526. Sperry Gyroscope Co., Inc.—Directive antenna systems for defining a path of electromagnetic wave energy. 28th April, 1945. (631662.)

14580. Union d'Electricité.—Installations including remote control transmissions, for the selective protection of electric networks. 18th May, 1945. (631729.)

17777. Radio Electronics, Ltd., Trist & Co., R., Molyneux-Ffennell, H. S., and Chambers, W. A.—Photo-electric cells. 13th June, 1946. (631798.)

19023. Sadir-Carpentier.—Radio beacons. 25th June, 1945. (631872.)

20342. Philips Lamps, Ltd.—Television receivers. 11th July, 1945. (631800.)

20894. Compagnie Générale de Télégraphie sans Fil.—Thermionic valve circuits for the production of pulses of high-frequency energy. 19th September, 1939. (631801.)

20627. British Thomson-Houston Co., Ltd.—Circuits for a plurality of electric-discharge lamps. 11th July, 1945. (631730.)

23900. Decca Record Co., Ltd., and Grenfell, A. R.—Radio navigation systems. 12th August, 1946. (631668.)

24900. Colonial Radio Corporation.—Push-button control of signal-seeking receivers. 5th October, 1944. (631732.)

25085. Philips Lamps, Ltd.—Liquid-cooled optical apparatus. 4th March, 1943. (631733.)

25489. O'Brien, W. J.—Automatic volume control circuits. 27th August, 1945. (631735.)

25864. Sperry Gyroscope, Inc.—Flux valve apparatus for magnetic field detection. 28th August, 1945. (631876.)

27647. Rahbek, K.—Method for the production of artificial semi-conductors. 27th February, 1946. (631804.)

30343. Faudell, C. L.—Electromagnetic lenses. 11th October, 1946. (631881.)

32041. P.A.M., Ltd., and Holt, H. B. W.—Electronic amplifiers. 29th October, 1946. (631808.)

32267. Sadir-Carpentier.—Radio receivers and other receivers of electrical oscillations. 2nd November, 1945. (631960.)

32532. Philips Lamps, Ltd.—Electric resistances and the manufacture thereof. 7th May, 1943. (631739.)

33319. Amalgamated Wireless (Australasia), Ltd.—Radio and like high-frequency transmission lines. 19th June, 1946. (631742.)

33621. Sissman, L.—Radio receiving systems.—12th November, 1946. (631809.)

34589. Automatic Electric Laboratories, Inc.—Telephone systems 21st November, 1945. (631883.)

36111. Wells, F. H.—Pulse signalling systems. 1st February, 1946. (631884.)

36178. Marconi's Wireless Telegraph Co., Ltd., Green, E., and Stokes, W. O.—High-frequency amplifiers, radio transmitters and the like. 6th December, 1946. (631744.)

36619. Baird, Ltd., J. L., Anderson, E. G. O., and Bernard, G. G.—Cathode-ray tube modulation circuits. 11th December, 1946. (631965.)

36643. Soc. Francaise Radio-Electrique.—Electron-discharge tubes and other devices having evacuated envelopes and vacuum-tight joints therefor. 11th December, 1945. (Cognate application 36644/46.) (631811.)

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234. Philips Lamps, Ltd.—Manufacture of magnetic material. 31st May, 1943. (631886.)

943. Bendix Aviation Corporation.—Resistance pile electric regulators. 1st February, 1946. (631815.)

2131. Standard Telephones & Cables, Ltd., and Skelton, D. E.—Acoustic diaphragms. 23rd January, 1947. (631970.)

2623. Westinghouse Electric International Co.—Alternating-current propulsion systems for ships. 30th July, 1943. (631971.)

3116. Pye, Ltd., Bennett, A. J., and Lax, L.—Sawtooth current oscillation generator. 1st February, 1947. (631972.)

4266. Westinghouse Electric International Co.—Method of and apparatus for assembling and calibrating thermostatic switches. 26th February, 1946. (631889.)

4854. Metropolitan-Vickers Electrical Co., Ltd., and Scoles, G. J.—Electronic timing circuits. 19th February, 1947. (631678.)

7499. Schapiro, H.—Electric toasters. 18th March, 1947 (631891.)

9069. Philips Lamps, Ltd.—Coated self-starting welding rods. 8th April, 1946. (631823.)

9322. Dupont, R.—Thermally-actuated electric circuit-breakers 11th April, 1946. (631824.)

9370. Marconi's Wireless Telegraph Co., Ltd.—Superheterodyne radio receivers. 9th April, 1946. (631688.)

9549. Berthiez, C. W.—Protecting arrangements for the commutator and brushes of dynamo-electric machines. 4th October, 1945. (631826.)

9608. General Electric Co., Ltd., Davies, E. C., and Friedlander, E. S.—Electric motor control systems. 10th April, 1947. (631892.)

10429. Wilson Co., H. A.—Valves or switches. 17th September, 1940. (631893.)

10997. British Thomson-Houston Co., Ltd., Kinman, T. H., Hibberd, R. G., and Hayward, C.—Pocket radio receiver. 24th April, 1947. (631758.)

11029. Cinema-Television, Ltd., and West, S. S.—Geiger-Muller tubes and circuits for use therewith. 24th April, 1947. (631691.)

13240. Pierce Foundation, J. B.—Corner unit of electrical conducting systems. 26th October, 1946. (631976.)

14478. Turner, Ltd., E. R. & F., Leggett, P. A., and Payne, C. F. E.—Starting of single-phase induction motors. 31st May, 1947. (Cognate application 15153/48.) (631696.)

15311. Conradi, F. A. J. (Legal representative of Conradi, E. S., deceased).—Electric lamp holders. 10th June, 1947. (631979.)

15628. Akt.-Ges. Brown, Boveri & Cie.—Air-conditioning plant for mines. 13th July, 1946. (631897.)

15646. Standard Telephones & Cables, Ltd.—Regulated power supply equipment comprising parallel connected rectifiers. 10th March, 1943. (631697.)

15715. Automatic Telephone & Electric Co., Ltd., and Gordon-Wright, J. G.—Electric signalling systems. 14th June, 1947. (631836.)

16460. Posen, S., and Hanson, H. E.—Electronic hearing aid. 25th July, 1946. (631702.)

16825. Kolster-Brandes, Ltd., Trier, R. H., and Murray, G. C. V.—Variable inductances for wireless receivers and the like. 26th June, 1947. (631705.)

20033/4. Superheater Co., Ltd., Small Electric Motors, Ltd., and Rudorff, D. W. A. F.—Apparatus for testing materials by magnetic or electrical analysis. 25th July, 1947. (Addition to 594158.) (631987/8.)

21082. Sylvania Electric Products, Inc.—Ultra-high-frequency electric-discharge tube. 13th November, 1943. (631709.)

21670/1. Everett, Edgcumbe & Co., Ltd., and Gruchy, J. N. de.—Electrical measuring instruments. 7th August, 1947. (631890/1.)

21775. Western Electric Co., Inc.—Electric wave filters incorporating piezo-electric crystal elements. 30th March, 1943. (613772.)

21932. Standard Telephones & Cables, Ltd., Foulkes, C. H., and Childs, P. A.—Electromagnetic contact-making relays. 8th August, 1947. (631713.)

23317. General Electric Co., Ltd., and Rose, W. R.—Electromagnetic step-by-step switches. 22nd August, 1947. (631910.)

23588. Caldwell, R. H.—Electric condensers. 27th August, 1946. (631993.)

23928. Standard Telephones & Cables, Ltd., Beveridge, J. C., and Pergunas, S. W.—Manufacture of concentric conductor electric cables. 29th August, 1947. (631914.)

24322. Hoover Ltd.—Electric hand-irons. 7th September, 1946. (631915.)

25159. Standard Telephones & Cables, Ltd., Childs, P. A., Hartley, G. C., and Webb, L. H.—Electromagnetic devices. 15th September, 1947. (631716.)

25160. Standard Telephones & Cables, Ltd., and Childs, P. A.—Electromagnetic contact-making relays. 15th September, 1947. (631717.)

25973. Mond Nickel Co., Ltd. Magnetic separators. 24th September, 1946. (631854.)

27766. British Thomson-Houston Co., Ltd., and Bache, R. F.—Pressure regulator for blower or compressor. 16th October, 1947. (631779.)

32748. Automatic Telephone & Electric Co., Ltd., and Woodland, C. R. Pneumatically operated electric switching devices. 12th December, 1947. (631788.)

33480. Akt.-Ges. Brown, Boveri & Cie.—Methods for making transformer cores. 17th March, 1942. (631789.)

35196.—Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Arrangements for recording variations in the electrical resistance of the human body. 6th September, 1945. (631925.)

35272. Compagnie pour la Fabrication des Compteurs at Matériel d'Usines à Gaz. — Remote control selective receiving device. 13th January, 1939. (631793.)

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82. Vickery, H. F.—Pull-cord operated electric switches. 1st January, 1948. (631927.)

211. Daly (Condensers), Ltd., and Walker, H.—Manufacture of electrolytic capacitors, dry batteries and the like. 2nd January, 1948. (631932.)

250. Rotax, Ltd., and Bourne, W. G.—Electromagnetic reversing switches. 3rd January, 1948. (631933.)

264 Musted, G. G.—Means for supplying electric current to portable electric lamps for use in connection with electric welding. 5th January, 1948. (631999.)

300. Wynn, E. E. G. F.—Electric bed-airing device. 5th January. 1948. (621001.)

Amended Specifications

564231. Linde Air Products Co.—Electric welding.

597577. British Thomson-Houston Co., Ltd.—Bases for electric discharge devices such as electric discharge lamps.

604156. Sulzer Frères Soc. Anon — Gas turbine plants.

Trade Marks

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered within a month of 23rd November.

H (design). No. 672,959. Class 9. Apparatus consisting of thermostats and electric switches for controlling oven temperatures.—"Diamond H" Switches, Ltd., Gunnersbury Avenue, London, W.4.

MARY ANN. No. 680,878. Class 9. Electrical apparatus and instruments, parts and fittings, all included in Class 9, but not including vacuum cleaning machines, electric flat irons, kettles or tea infusers. MARY ANN. No. 680,879. Class 11. Electrical instruments, apparatus and installations included in Class 11 for lighting, heating, cooking, refrigerating, drying and ventilating.—Thorn Electrical Industries, Ltd., 105-109, Judd Street, London, W.C.1.

HEALAFLOM. No. 680,244. HEALAMAS. No. 680,245. HEALAPORT. No. 680,246. Class 10. Electro-medical curative apparatus and appliances.—Heala (Electro-Medical), Ltd., 13b, High Road, London, N.W.6.

RESOMAX. No. 680,826. Class 10. High voltage X-ray apparatus for use in deep therapy, and parts thereof included in Class 10.—Newton Victor, Ltd., 15-19, Cavendish Place, Cavendish Square, London, W.1.

NETTLE. No. 675,039. Class 11. Electric lighting ceiling roses, lamp holders and hand lamps.—Victor H. Iddon, Ltd., Harper Road, Wythenshawe, Manchester.

Information Department

THE extensive records of our Information Department enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the makers of the following:—

"IMP" conduit fittings.

General inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by the Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section, the date of the issue is given in parentheses.

Australia. — MELBOURNE. — 21st December. State Electricity Commission. Supply of twenty-four electrically operated travelling cranes. (See this issue.)

Chester-le-Street.—R.D.C. Electrical installation in fifty houses being built at Great Lumley. Plans by F. Bowman, Estate Office, Birtley.

Egypt.—CAIRO.—18th April. Ministry of Public Works, Mechanical and Electrical department. Electric pumping station and cable line at Ameria, Qualubia Provinces (C.R.E. (I.B.) 32698/49. Ten 1789.)*

Longbenton.—10th December. U.D.C. Electrical installations in housing schemes. (25th November.)

Manchester.—7th December. Highways Committee. Supply of 500 street lighting lanterns, 100,000 yd of copper wire and 14,000 yd of cable. (25th November.)

Newbiggin (Northumberland).—U.D.C. Electricians' work for thirty-four new houses on the Spital Farm housing site. Plans by the Council surveyor.

New Zealand.—WELLINGTON.—2nd May. State Hydro-Electric Department. Turbines and generators for the Whakamaru power station. (C.R.E. (I.B.) 34083/49. Ten/800.)*

Sunderland.—Education Committee. Electrical installations in the Springwell Primary Junior School and the Thorney Close Primary Junior and Infant Schools. Plans by the borough architect.

Thailand.—BANGKOK.—29th December. Railways Department, Ministry of Communications. One 1,000 kVA step-down transformer. (25th November.)

Uruguay.—MONTEVIDEO.—27th April. Usinas Electricas y Telefonos del Estado. Supply of 8,000 6kV and 17,000 15 kV porcelain insulators. (C.R.E. (I.B.) 34074/49. Ten/803.)*

Whitley Bay.—U.D.C. Electrical installation in seventy-eight houses on the Seatonville Estate. Plans by E. Roberts, surveyor.

Orders Placed

Chester.—Corporation. Recommended. Supply and installation of lighting equipment at the Grosvenor Museum (£1,058).—Merseyside and North Wales Electricity Board.

Electrical wiring of 84 houses, Blacon estate (£3,260).—Lindsay Crawford Engineering Corporation.

Durham.—County Council. Lighting standards and equipment for the Birley by-pass road (£1,142).—B.T.H. Co.

London.—L.C.C. Housing Committee. Renewal of the electrical installation at Bruce House lodging house (£3,054).—Courtney Pope (Electrical).

Education Committee. Electrical installation At Dalgleish Street School, E.14.—Edgar C. Porter, Ltd.

Newcastle-on-Tyne.—City Council. Installation of fluorescent lighting at workshops for the blind (£333).—Morris Smiles, Wallsend.

Stockton-on-Tees.—Town Council. Electrical installation at branch library (£272).—W. Stewart and Son, Norton.

Sunderland.—Education Committee. Electrical installation at Technical College pharmaceutical laboratory (£303).—North of England Engineering and Electrical Co., Ferryhill. Electrical installation in connection with adaptation of Milton Hall, Brampton, Cumberland (£360). —North Western Electricity Board. Centralized electric vacuum system at Springwell county primary infants' school (£714).—Lamson Engineering Co.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Acton.—Flats (54), Oldfield estate; borough engineer.

Factory; Cherry Perkins & Cornish, Ltd., 1, Brunel Road.

Ash (Surrey).—County secondary school, Yeoman's Bridge (£143,150); county architect, Kingston-on-Thames.

Barking.—Further maternity accommodation at Barking Hospital; C. C. Shaw, architect, Town Hall.

Barnsley.—Alterations to buildings, Queen's Road, for pathological laboratory, X-ray room and central hospital stores; C. F. Moxon, architect, 35, Cockerham Lane.

Barnstaple.—Primary school, Sticklepath; H. V. de Courcy Hague, county architect, 97, Heavitree Road, Exeter.

Batley.—Houses (24) and 28 flats, Staincliffe estate; borough surveyor.

Belfast.—Crematorium (£48,000); borough engineer.

Birmingham.—Houses (80), Nimmings Farm estate, Northfield; city engineer.

Bournemouth.—Houses (196); borough architect, Room 98, Town Hall.

Bradford.—Operating theatre, St. Luke's Hospital, Little Horton Lane; architect to Leeds Regional Hospital Board, 29-31, Eastgate, Leeds, 2.

Bristol.—Flats (96), Lawrence Weston estate; city architect.

* Specifications may be inspected at the Commercial Relations and Exports Department, Board of Trade, Thames House North, Millbank, S.W.1 (Victoria 9040).

Burton-on-Trent.—Technical college, Soho site; Richard Sheppard & Partners, architects, 21, Coram Street, W.C.1.

Buxton.—Police headquarters (£100,000) for Derbyshire C.C.; county architect.

Cardiff.—Block of offices and workrooms, with dwelling accommodation, Fitzalan Place and Newport Road; Cardiff Institute for the Blind, Longcross Street.

Cheshire.—School at Wilmslow (£59,305); county architect, Chester.

Cockermouth.—Additions to the Derwent Mills for Millers (Great Yarmouth), Ltd.; J. Gilmore and Son, builders, Franklands, Workington.

Darlington.—Central kitchen at Gainford for Durham C.C. (£9,500); Blackett and Son, builders, Bondgate, Darlington.

Fareham.—Flats (60), Fareham Park estate; U.D.C. surveyor.

Flints.—Modern schools at Holywell and Buckley (630 places each); W. Griffiths, deputy county architect, Mold.

Garstang.—Houses (34), Kepple Lane; W. M. Kelly, surveyor to R.D.C.

Glasgow.—Factory, Pinkston Road; Cooke Bros., 351, Shettleston Road.

Completion of Mitchell Library (£50,000); town clerk, City Chambers.

Goole.—Houses (74), Epsom Avenue; borough engineer.

Greenford.—Works extensions; Glasso Paint Products, Ltd., 28, Wadsworth Road.

Henley-on-Thames.—Houses (30), Sonning Common; borough architect.

Hereford.—Laboratory, offices, etc., Grandstand Road; Cadbury Bros., Ltd., Bournville, Birmingham.

Hindley.—Bungalows (26), Castle Hill estate; surveyor, U.D.C.

Houghton-le-Spring.—Houses (136) at Barnwell estate for the U.D.C.; J. Laing and Sons, builders, Dalston Road, Carlisle.

Leicester.—Houses (125), Evington House and Goodwood estates; J. S. Fyffe, city housing architect.

Luton.—County secondary technical school, New Bedford Road; borough engineer, Town Hall.

Middlesbrough.—Houses (204), Beechwood; J. A. Kenyon, borough engineer.

Newcastle-on-Tyne.—Bank premises, Stephenson Street for Newcastle Savings Bank; T. Clements and Son, builders, Selborne Gardens.

Northwood (Middlesex).—Radiotherapy centre and plastic unit, Mount Vernon (£113,544); North West Metropolitan Regional Hospital Board, 11a, Portland Square, London, W.1.

Nuneaton.—Three three-storey blocks of flats; F. Gibberd, architect, 35, Gordon Square, W.C.1.

Oxford.—County infants' school, Barton (£51,325); Knowles & Son (Oxford), Ltd., builders, 36, Holywell Street.

Padiham.—Houses at Slade Lane estate; U.D.C. surveyor.

Plymouth.—Secondary modern school, Efford estate; E. G. Catchpole city architect, Seymour Road.

Rawdon.—Pithead baths, canteen, etc., (£95,358), for Miners' Welfare Commission; Hugh Cox & Sons, Ltd., builders, Fletcher Street, Heanor.

Rochdale.—Grammar school, Balderstone, and junior school, Kirkholt; W. H. G. Mercer, borough engineer, Town Hall.

St. Helens.—Houses (50), Hawes Avenue estate; borough engineer.

St. Paul's Cray.—Health centre (£95,000); county architect, County Offices, Maidstone.

Salford.—School, Summerville Road, Pendleton (£72,055); city engineer.

Seisdon.—Block of flats, Wombourne; Surveyor, R.D.C. Offices, Wombourne.

Southampton.—Junior school, Beech Avenue, and alterations and war damage repairs to Southampton Technical College; R. R. H. Meggeson, town clerk, Civic Centre.

Stalybridge.—Houses (70), Buckton Vale estate; Greenwoods Building Industries, Ltd., Oldham.

Sunderland.—Crematorium at Bishopwearmouth Cemetery (£10,000); Applebys (Builders), Ltd., Trafalgar Street, Newcastle-on-Tyne.

Surbiton.—Factory, Guilford Villas site; Opticrafts, Ltd., 1a, Alpha Road.

Houses (122) Gosbury Hill, Fullers Way and Rhodron estates; G. Blair Imrie, architect, Teffon Magna, Salisbury.

Torquay.—Primary school, Watcombe (£59,070) for Devon C.C.; T. Brook & Co., Ltd., builders, Totnes.

Totternhoe.—County primary school; county architect, Shire Hall, Bedford.

Tyldesley.—Houses (24), Shakerley estate; U.D.C. surveyor.

Wallasey.—Reinstatement of Civic Hall; Stuart McLauchlen, architect, Royal Liver Buildings, Liverpool.

Westmorland.—Adaptation of Fayrer Holme, Storrs Park, Lake Windermere, as hostel (£10,000); county architect, Kendal.

Wigan.—Extensions to Wigan Infirmary (£150,000); T. Duffy, architect to Manchester Regional Hospital Board.

Worcestershire.—Secondary modern school at Redditch; C. E. Harris & Partners, 3, Bedford Square, London, W.C.1.

York.—Houses (100), Moor Lane estate; city engineer & architect.

Factory; Minster Engineering Co., Ltd., Dennison Street, Huntingdon Road.

Television Sales

TOTAL production of television receivers of all types in October, 1949 was approximately 27,000 and manufacturers sold approximately 36,500 sets. Both figures, which are provisional ones provided by the British Radio Equipment Manufacturers' Association, were the highest monthly totals so far recorded, the previous best being for September last, when 18,000 receivers were produced and 21,000 sold. Including the October figures, the British radio industry has manufactured 260,550 television receivers since the war and has sold to the trade 252,500.